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THE MANAGEMENT AND TREATMENT OF ADVANCED CARCINOMA.¹

By E. J. B. HARDCASTLE,
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THE management and treatment of advanced carcinoma present a challenge to the medical profession. All too frequently in the past patients have been refused treatment on the grounds that there would be no chance of a cure and therefore nothing should be done. This is far from the case, because today surgery and radiotherapy have much to offer for the relief of these patients.

The word "advanced" is rather indefinite, and I think tonight the discussion should be confined to patients with carcinomata in which some form of treatment is required for relief of symptoms. With vigorous active treatment a percentage of these may survive, with or without disease, in relative comfort for several years. These patients would be included in the stages III and IV of the International Classification system. I shall exclude terminal cancer patients.

As a cause of death, malignant disease is today the most important single disease. It is second on the list of causes of death, being preceded only by cardio-vascular and

respiratory disease. It is not unreasonable to forecast that cancer will reach a peak as a cause of death in the human race. Cancer is on the increase in the following sites: lungs, brain, pancreas, stomach, rectum, prostate and ovary; it is on the decrease in the oesophagus, the liver, the uterus, the lip, the tongue and the penis.

The figures for England and Wales in the year 1945 are relevant in this connexion. They are as follows: The total population was 42,600,000; 28,000,000 persons, or two-thirds of the population, were aged under forty years; 14,000,000 persons, or one-third, were aged over forty years. Of the 28,000,000 aged under forty years, 5227 died of cancer. Of the 14,000,000 aged over forty years, 68,526 died of cancer. That is, in the younger age group 1-25 people in 17,000 died of cancer; in the older age group 1-25 people in 250 died of cancer.

With this slow but relentless increase in cancer rates there must occur a gradual increase in the number of patients who present late in the disease.

Table I presents figures from the Christie Hospital and the Holt Radium Institute, Manchester. Here it can be seen that in a large sample of new cancer cases recorded just over half the patients are first examined late in the disease, and about 10% are too advanced in their disease for any form of treatment. These figures are, of course, ten years old, and since then further advances have been made in palliative surgery and radiotherapeutic procedures, and today perhaps more of these patients could be treated. Nevertheless, it is a vast problem which must be tackled.

¹ Read at a meeting of the New South Wales Branch of the British Medical Association on June 28, 1956.

At present in Sydney facilities for the treatment and management of this type of patient are very limited. All too often we apply the fact of the eventual hopelessness of the situation to all aspects of the patient's case, with the result that the patient is neglected and we fail in our duty as physicians. Why we give meticulous attention to an incurable cardiac or hypertensive patient with congestive failure and consign the equally afflicted cancer patient to his own devices remains a mystery, but this is the case all too frequently. It appears that we must readjust our approach to cancer so that each patient with either early or advanced disease receives the best possible treatment.

The only curative treatment for cancer today is by destructive methods—either surgery or radiotherapy. For the time being these two methods are our only effective therapy, but most of these therapeutic procedures are palliative in effect, although curative in intent. Hence the majority of cancer patients eventually present problems in palliation. When incurability is clinically apparent, considerable assistance still may be given to the patient in the way of maintaining an active and productive life, let alone a relatively symptom-free existence.

With palliative surgery, radiotherapy, hormones, radioactive isotopes and some of the new chemotherapeutic drugs, much can be done to relieve the advanced carcinoma sufferer.

First, radiotherapy is of proven value in advanced local disease and in metastatic spread. Advanced skin lesions are still seen, although less frequently so than in the past. Those on the limbs are probably best treated by amputation, but those on the body and face can be treated by radiotherapy. Large, ulcerating, fungating and bleeding lesions can be arrested, and in some cases cured, by adequate radiation treatment. Other lesions which present with a considerable destruction of tissue, including bone, may be treated by radiotherapy and surgery.

Radiotherapy plays its greatest part in the treatment of advanced accessible carcinomata.

Advanced carcinomata of the tongue, the floor of the mouth and the tonsil, with fixed glands, are still frequently seen in a radiotherapeutic department. Many of these tumours are fixed to the mandible. Some are too advanced for any treatment because of the patient's poor condition; but provided that the patient can stand treatment, some palliative control of the disease is often possible. There is a general feeling that once bone is involved radiotherapy is contraindicated, as irradiation will cause bone necrosis and hence increase the patient's suffering. This is not so, and many lesions which involve the mandible can be made to heal without damage to underlying bone. Even when the mandible is involved the lesions can be made to heal satisfactorily.

Although these lesions are squamous carcinomata, they vary a great deal in sensitivity; some of them actually melt away under treatment; others, of course, prove disappointing in their response. Patients with lesions of the posterior third of the tongue, the tonsil and the post-nasal space often present with huge bilateral cervical glands. These lesions are in general all very radiosensitive, and although the ultimate outlook is poor, good palliative results are achieved, survival sometimes being measured in years.

Advanced carcinoma of the larynx is a frightful condition. Some patients present with soft tissue tumour, eroded cartilage and a very poor airway. Should these patients be treated with a low daily dosage, oedema of the larynx is prevented, good growth-restraint is achieved and patients can survive for some time. I believe that a tracheotomy should be performed only as a life-saving measure, as it hinders rather than helps radiotherapy. Several patients with advanced carcinoma of the larynx have undergone total laryngectomy after irradiation and they appear to be progressing satisfactorily.

There is one type of carcinoma of the thyroid in which radiotherapy is often life-saving—that is, the anaplastic carcinoma of uniform cell type. It presents as a huge rapidly growing tumour of the thyroid, often with retro-

sternal extension. It rapidly causes death by compression of the trachea. This is one of the most radiosensitive tumours and relief of respiratory obstruction occurs within forty-eight hours.

There are quite a number of cases in which inoperable glands are present in the neck although no primary growth is evident or even found *post mortem*. The pathology of these glands varies, but mostly the condition is squamous carcinoma of varying degrees of differentiation. Palliative control for long periods is possible with adequate radiotherapy.

Carcinoma of the lung is on the increase, and all too often by the time the patient presents there is no hope of cure. There are two symptoms which can be palliated extremely well with X-ray therapy. One is the superior venal caval obstruction which often occurs in rapidly growing bronchial carcinomata. In over 70% of cases symptoms are rapidly relieved, permanently in quite a number, until death occurs by hepatic failure. The other symptom is severe dyspnoea which occurs owing to collapse of the whole of one lung. X-ray therapy relieves the bronchial obstruction and the lung reexpands, so that the patient is given a few months of relative comfort. Some bronchial carcinomata, by direct extension, erode ribs, and X-ray therapy is of value in this type.

Carcinoma of the cervix seldom metastasizes from the pelvis; it kills the patient by ureteric obstruction or by cachexia due to sepsis and blood loss. Except in cases in which recto-vaginal or vesico-vaginal fistula is present, or frozen pelvis with gross involvement of the septa, or uremia is imminent, treatment by radium and X rays in advanced disease is possible. At the worst bleeding and foul discharge are controlled, and at the best it is possible to salvage 24% of patients in stages III and IV; the same applies to inoperable carcinomata of the uterine body or ovary. Patients with inoperable carcinomata or with residual tumour after operation should be given a course of X-ray therapy. Reports from abroad show a five-year survival rate of between 19% and 24%. Although fibrosarcoma of the uterus is rare, and usually relatively radio-resistant, Dr. Harold Ham has reported a case of a rapidly growing fibrosarcoma of the uterine body which had invaded the laparotomy incision and was presenting like a large mushroom above the level of the skin. The patient survived for fifteen years following irradiation.

Cancer of the breast is the most common malignant disease of women. If the patient is unsuitable for radical mastectomy because of advanced local disease or the presence of distant metastases, then she presents a problem of how best to manage the disease. Tonight we are not dealing solely with this vast problem, so my remarks will be very brief and general only.

If clinically the disease is confined to the breast and is inoperable, then X-ray therapy to the breast and glandular areas is justifiable. This often prevents fungation, relieves swollen, painful arms and heals bleeding ulcerated areas. If the patient is in the pre-menopausal period then a more or less radical course may be attempted, with the possibility that bilateral oophorectomy may be considered. For the more elderly, local X-ray treatment to the area causing symptoms only may be considered. If distant metastases are present as well as local disease then each case must be considered individually, and one or several of the procedures that are available today should be investigated. As has been mentioned before, this is a vast subject and I will have more to say about it later on.

When the malignant process has spread from the primary site to distant organs the management of the patient presents a different problem. There is now little hope of a long-term survival and treatment must be aimed at relieving symptoms such as pain, weakness, dyspnoea *et cetera*. The usual sites are the liver, the lungs, the bone and the brain.

It is generally accepted, except in isolated cases, that once liver metastases are present the condition is hopeless and no further active treatment is warranted, with the possible exception of very radio-sensitive tumours. This is not so with metastases in other situations, since some

patients may survive for long periods with metastatic disease.

The most common condition seen is osseous metastases from carcinoma of the breast. Provided that the primary area is free of disease, then single metastases should be treated vigorously, and some long-term survivals in comfort are not unusual. Even when multiple metastases are present useful palliation is obtained by preventing pathological fractures or transection of the cord due to collapsed vertebrae. Radiotherapy should be the first line of treatment in these cases; other measures should be reserved until later. It is strange but true that a number of relatively radio-resistant tumours, when metastatic in bone, respond to a moderate course of X-ray therapy. Such tumours—hypernephroma and tumours of the prostate, bowel, thyroid and salivary glands—can and do show adequate response in that pain is relieved and bone recalcified.

TABLE I.

The Christie Hospital and Holt Radium Institute, Manchester: Radiation Treatment, 1940 to 1944; New Cancer Cases, all Sites Excluding Basal Cell Carcinoma.

Group.	Number Reviewed.	Known Alive.	Crude Survival Rate.
Treated early	3527	1912	54%
Late	4261	579	14%
Unstaged	750	372	50%
Not treated:			
Too advanced	1226	—	—
Patients refused	108	—	—
Total	9872	2863	29%

When metastases occur in the lungs the outlook is poor, but not always hopeless. The general opinion appears to be that if breast cancer is present in the lungs then radiotherapy is contraindicated, and other measures such as bilateral adrenalectomy or the administration of hormones should be considered. Also, radiotherapy has nothing to offer in lung metastases from bowel carcinomata or melanomata. However, in metastases from some tumours wide-field irradiation of the lungs produces some startling results; seminoma of the testis is such an example. Widespread chest metastases rapidly melt away. Even some of the moderately radio-sensitive tumours can respond. Chest metastases from tumours of the thyroid, salivary gland, ovary and body of the uterus show striking variations in radio-sensitivity, and provided that the patient is in good condition a course of X-ray therapy is warranted.

The development of cerebral metastases occurs late in the disease, and usually the patient has concurrent lung or liver metastases as well; so active treatment is often contraindicated. Occasionally, however, solitary metastases do occur, and they may be worth treating either by palliative craniotomy or by deep X-ray therapy.

Some intracranial metastases from breast cancer respond to a short course of X-ray therapy and are therefore worth treating, if the patient is otherwise in good condition. Some carcinomata of the lung metastasize to the brain early with a symptomless primary growth. If, after craniotomy, the pathological picture shows the tumour to be secondary and moderately undifferentiated, then post-operative deep X-ray therapy is warranted with the hope of achieving a moderately long symptomless survival period—that is, a period measured in months rather than years.

Carcinoma of the lung is another example.

Recently, a patient was in Royal Prince Alfred Hospital in a semiconscious condition. A craniotomy was performed; the biopsy revealed an anaplastic carcinoma (? primary tumour in the lung). A chest X-ray examination showed a shadow in the right hilar region. He was given a course of treatment to the operation area at the request of the neurosurgeon, and within two weeks was much improved. The patient still remains well some eight months after treatment.

That, very briefly, is the approach to the treatment of advanced carcinoma with X-ray therapy. There seems little doubt that with the provision of supervoltage apparatus shortly many patients who today are considered unsuitable for treatment may in the future be treatable. Such tumours as recurrent carcinomata of the rectum and pancreas, and even isolated liver metastases, may all have possibilities for palliative therapy. Certainly all patients with advanced ear, nose and throat lesions would be best treated with supervoltage apparatus. Advanced bladder tumours also fall into this category.

Another approach to the treatment of advanced carcinoma is the use of chemotherapeutic compounds and radioactive isotopes. The principle of such treatment is to administer, either orally or parenterally, a chemical compound which will inhibit the growth of a malignant tumour without adversely affecting the metabolism of normal cells. Hence these compounds offer possibilities in the treatment of most advanced cancer sufferers. However, so far none of these compounds has produced a cure, although temporary control of disease has been achieved.

As tonight's paper is based primarily on the treatment of advanced carcinoma, I shall just say that the reticuloses have been the main group treated successfully by chemotherapeutic drugs. However, hormones must be mentioned. By altering the hormonal balance of the patient—for example by the anabolic effects of the steroid hormones or the inhibition of gonads, pituitary or adrenal cortex by the administration of hormones or by surgery—some striking remissions in advanced breast or prostatic cancer have been produced.

The use of hormones in advanced cancer offers many benefits, in that administration is simple, and even if no ultimate benefit has been achieved no harm is usually done. Some tumours are hormone-dependent, and thus if the hormonal balance is altered the patient is able to increase his resistance to the tumour. In 1941 Huggins demonstrated that high acid phosphatase values in prostatic carcinoma could be reduced by bilateral orchidectomy or oestrogen administration. However, the effect was temporary and inevitably after two or three years the response was lost.

Estrogens similarly have been of great value in advanced breast cancer, particularly in women after the menopause. Regression of the primary growth and of soft tissue metastases has been noted in about 50% of patients aged over sixty years. Lung metastases can be controlled for varying periods up to two or three years. Occasionally, relief of pain in osseous metastases has been reported. It may take up to three months to produce an adequate response.

Androgens are also used in breast cancer. They may act by suppressing the pituitary gonadotrophic hormone or by creating a hormonal imbalance. They are useful in the relief of pain from multiple bone metastases. In a few cases they may control soft tissue metastases. They are indicated in the pre-menopausal age groups.

I have used androgens in the treatment of a large number of patients, and find that the result in general have been very poor. In view of the unpleasant side effects, patients should be carefully selected, and if they are not responding treatment should not be continued just for the sake of doing something. Also, if pre-menopausal patients with widespread bony metastases do respond, in that pain is quickly relieved, then such patients should be immediately considered for bilateral adrenalectomy. In this way they have the benefit of the operation whilst in fairly good general condition.

Radioactive isotopes also have a place in the treatment of certain advanced carcinomata. The isotope is taken orally, injected or placed in the body cavities. Once the isotope is administered, it is then selectively absorbed by different organs, tissues and body fluids. Thus these isotopes are used as irradiation sources at the site of the tumour. It must be remembered that once they are administered they continue to decay until the stable element is produced, and they cannot be removed. Hence

great care must be taken with dosage *et cetera*, otherwise it is possible to endanger the patient.

There are two isotopes which have been used frequently in the treatment of widespread cancer. First, radioactive iodine has been used in thyroid cancer. However, unless the tumours take up a reasonable amount of the radioactive iodine, treatment by this method is valueless. Less than 5% of thyroid carcinomata can be treated in this fashion. Radioactive colloidal gold has been used in the treatment of malignant effusions, mostly caused by breast or ovarian cancers. As it has a short half-life of 2.7 days there are difficulties with regard to the availability of adequate supplies for any large clinical trials here, and so cases in which it has to be used must be carefully selected. A newer preparation, radioactive chromate phosphate, which is actually radioactive phosphorus in colloidal form, has now been used in America for these conditions. It is a pure β ray emitter and has a half-life of fourteen days, so that many difficulties with transport and cost are overcome. The dosage used in clinical trials is small—only about 7.5 to 10 millicuries. The results seem to show that about 25% of patients respond, in that effusions do not recur so rapidly.

Local infiltration of inoperable prostatic and cervical cancer with radioactive gold has been tried in clinics abroad, but so far no startling results have been reported.

THE MANAGEMENT AND TREATMENT OF ADVANCED CANCER.¹

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DESPITE treatment, more than half of all patients suffering from cancer eventually die of the disease. In the subterminal and terminal stages these patients require considerable medical and nursing attention, and this should be just as sympathetic and skilful as that given to patients who it is thought may recover.

Recent advances in surgery and progress in the treatment of cancer have made it possible to provide definite palliation in many more cases of advanced cancer than formerly. On the other hand, there has been no significant fall in the death rate from cancer per head of population over the last few decades.

Radiotherapy, which has just been discussed by Dr. E. J. B. Hardcastle, and hormone therapy both provide some degree of palliation in certain advanced cancers. So also do operations such as oophorectomy, castration, adrenalectomy and hypophysectomy, which alter the hormone environment of the cancer.

The hormones at present in use for the treatment of cancer include testosterone, oestrogens, ACTH and cortisone. Although testosterone therapy has been widely used in the management of advanced carcinoma of the female breast, its use is sometimes associated with unpleasant side effects, and occasionally when this therapy is stopped there is an apparent stimulation of the malignant process. Oestrogens are of value in most cases of carcinoma of the prostate and in some cases of advanced carcinoma of the female breast when the menopause has occurred more than five years previously; but they are without any apparent effect in cases of malignant tumours of the testis. ACTH and cortisone are of value in some cases of Hodgkin's disease, lymphosarcoma, leukaemia and carcinoma of the prostate. Incidentally, the results of hormone therapy appear to depend to a large extent on its non-specific effects, such as improved protein synthesis. Another fact which also must be remembered in assessing the results of hormone therapy, and indeed when the results of any method of treatment of cancers is being assessed, is that their rates of growth are not regularly progressive.

Castration is used to produce palliation in cases of carcinoma of the prostate and of the male breast. Oophorectomy likewise is used with some effect to produce palliation and to delay the rate of growth of mammary carcinomata.

Adrenalectomy is an operation which has aroused considerable interest in the last few years, but there is not time to discuss it here except to say that the chief indication for its use at present is in the palliation of advanced mammary cancers. In some cases there is relief from the pain of osseous metastases within the first twenty-four hours of the operation. Strangely enough, this relief of pain is not always accompanied by any detectable regression of the metastases.

Patients requiring adrenalectomy are usually not in a fit state to withstand prolongation of the operation and this should be carried out expeditiously. Assessment of the patient's general condition prior to adrenalectomy is important, especially in order that the existence of gross renal failure may be excluded. It is really surprising how little difficulty is associated with post-adrenalectomy maintenance except in the presence of a superadded infection or other toxic condition.

Only a few inconclusive reports have yet appeared of cases in which hypophysectomy has been performed as a palliative measure in the later stages of certain cancers. Obviously this is a procedure for only a very restricted group of patients and for only a very restricted group of surgeons. If operative ablation of the pituitary gland is shown to be advantageous in these circumstances, it is likely that the various means of producing atrophy of the gland without operation will be developed further.

Operative Treatment.

Even in the advanced stages surgical attack on the cancer and its metastases has much to offer the patient from the point of view of both palliation and even cure. Incidentally, extreme age alone is no longer a contraindication to attempts at cure by radical operation, and alone it also is no contraindication to the use of palliative procedures such as would be employed in the treatment of younger patients.

The term "supraradical surgery" is now used to include further extensions of the accepted radical operations; but in addition it includes multiple visceral resections performed because of obvious extensions of the malignant process, resections of pulmonary or hepatic tissues containing metastases, pelvic exenterations, and "second look" procedures.

The introduction of the "second look" procedure or elective reexploration some time after the removal of the primary growth and before metastases are otherwise detectable is an aggressive approach to the problem of the management of cancer and is therefore worthy of further study. This problem has been discussed in a previous paper, and it suffices here to say that, apart from any controversy as to the indications for its use in other cases, whenever a second operation has already been required because of a localized metastatic mass an elective reexploration should be performed some months after the removal of this lesion and before other metastases become evident.

It is important to realize when repeated operative interference can only cause further misery and mutilation without hope of palliation. On the other hand, the criteria of inoperability will often depend on the experience, ability, enterprise and enthusiasm of the surgeon and will vary accordingly. In the treatment of certain cancers, such as those of the floor of the mouth, melanomata *et cetera*, extended procedures probably have a greater usefulness in the early stages of the disease than later on.

Some operations, such as Wertheim's hysterectomy, have been performed for decades, but their value and position are still in doubt.

Because of the appalling long-term results of so-called "radical" operations for certain cancers, more extensive resections have also been tried in the hope of greater success; but in many forms of cancer there has already been a swing back again in the opposite direction. For example, for carcinoma of the stomach wider resections were recommended, so that the omenta, the spleen, the lower part of the oesophagus, the whole of the stomach and perhaps part of the pancreas together with the associated lymphatic field were resected. However, such an

¹ Read at a meeting of the New South Wales Branch of the British Medical Association on June 28, 1956.

operation carries a greatly increased risk and it has now been shown that its routine use is not followed by any rise in the long-term survival rate. Accordingly, there has been a swing back to subtotal gastric resections whenever possible. It is of interest that even with this reversion to lesser gastrectomies the long-term survival rates after operation for cancer of the stomach have recently shown a definite improvement.

Despite the unpopularity now of supradradical resections for carcinoma of the stomach, pancreas *et cetera*, attempts are still being made to extend the operations for some cancers, such as carcinoma of the rectum. For the treatment of the latter, excision of the lymphatic field up to the origin of the inferior mesenteric artery has recently been revived by many surgeons, and in addition Deddish at the Memorial Hospital, New York, and others have proposed wider resections of the pelvic cellular tissues during abdomino-perineal resections.

The results of treatment of carcinoma of the breast have shown no significant improvement per head of population in the past few decades, and as a result of this both supradradical and lesser mastectomies have been revived. For example, extension of the classical radical mastectomy to include the removal of the internal mammary chain of lymph glands and the anterior mediastinal structures is advocated by Urban, whereas other attempts are again being made to attack the problem of carcinoma of the breast by more restricted procedures. Since 1948 McWhirter has published promising survival rates in cases of carcinoma of the breast treated by simple mastectomy followed by radiotherapy. However, these are only provisional figures, and it remains to be seen whether they will be significantly affected with the passage of time, when any surviving cancer cells are no longer restrained by the irradiation. For the present both the extended and lesser mastectomies remain experimental and it must be pointed out that there is no place for routine indiscriminate supradradical mastectomy.

Although there is no doubt about the fact that the rate of growth of malignant melanomata is affected by hormones, there is no evidence, once a malignant melanoma has developed, that there is any beneficial effect after the administration of androgens, oestrogens, cortisone or other hormone, or from castration, oophorectomy or adrenalectomy.

The futility of treating advanced malignant melanomata by operations such as forequarter and hind-quarter amputation is now realized. Whenever possible, regional lymph node dissections should be performed at or soon after the time of excision of a primary malignant melanoma; but the value in these cases of elective reexplorations of the lymph nodes at a later stage is in doubt.

The operation of pelvic evisceration or exenteration may be required for carcinoma of the cervix after radiotherapy has failed to control the disease, or less often for locally invasive carcinoma of the rectum or bladder. The most common indication for pelvic evisceration is the presence of carcinoma of the cervix which has been treated with radiotherapy with the development of an intractable recto-vaginal fistula; such was the indication in my two cases. As Brunschwig has pointed out, the patient with infiltrating pelvic malignant disease *in situ* does not die in peace, and even if we are not optimistic enough to believe that such a patient may rarely be cured, it behoves us to obtain whatever palliation is possible in these cases.

General Management.

Before concluding I should like to refer briefly to the general management of the patient who is suffering from very advanced cancer, as distinct from management of the disease itself. At that stage, although very little can be done to affect the progress of the cancer, it is still possible to do much for the patient. More care and attention, rather than less, are then required on the part of his medical attendant, and any tendency to take the easy course and avoid the patient or to spend less time with him should be resisted. Even at this stage minor disabilities related or unrelated to the cancer should be efficiently and speedily treated, and in fact such treatment may immeasurably add to the patient's comfort. Lesions,

such as infections, however minor, take on an added importance to the patient who is already suffering from great pain.

Throughout the terminal stages it is important that all hope is not taken from the patient. While untruths should be avoided it is rarely necessary to tell the patient the whole truth. In most cases this is not sought; but, whenever it is, the diagnosis can be told without elaboration upon the seriousness of the lesion. In some cases it is necessary to reveal the nature of the disease in order to obtain the patient's permission for operation. This especially applies to abdomino-perineal resection of the rectum; but almost always this procedure will be accepted if it is presented as the price to pay for a good chance of cure.

Even though it may never be mentioned the presence of cancer will often be assumed by the patient when there is a long-drawn-out illness. This should be remembered in the management of conditions such as diverticulitis, and it should be specifically stated that no cancer is present whenever that is certain.

Anorexia and reactive depression from prolonged pain are two symptoms frequently found in these patients and require special attention.

The fact that it is no longer possible to offer the patient any chance of cure should not mean the cessation of medical, surgical and other treatment. Even in the terminal stages relief from pain is of course of the utmost importance to the patient.

Apart from palliative operations the relief from pain of patients with advanced cancer depends partly on adequate nursing attention, together with the use of analgesics and perhaps also of neurosurgical procedures. Of the analgesics, the weaker ones such as aspirin, "Nembutine" *et cetera*, should be used alone whilst they are adequate. Narcotics should be used only when relief is not otherwise obtainable. It is to be remembered that the stronger narcotics impair the appetite.

Codeine, pethidine, morphine or other opiates may eventually be required in increasing dosage. No patient should be allowed to die in pain whatever the dosage required. On the other hand this dosage should be the smallest which will produce relief, and it will be found that if these drugs are combined with the barbiturates the dosage required will be less. "Largactil" and other tranquilizers are a great help in allaying the patient's fears and also in reducing the nausea. They also may be combined with one of the narcotics, and in fact "Largactil" with pethidine is often a suitable combination for the patient with severe pain who is still ambulatory and able to attend for treatment.

Obviously, treatment designed to be palliative should be fairly certain to make the patient more comfortable. Treatment which causes some minor and temporary decrease in the size of the cancer but at the same time makes life less tolerable without lengthening it is not to be classed as palliative. Also, if the patient is reaching the terminal stages, the fewer investigations such as bronchoscopic examinations, opaque meal X-ray examinations, biopsies *et cetera* that are inflicted on him or her the better.

Whenever possible, procedures for the relief of severe pain, such as division of nerves, intrathecal injection of alcohol and more complicated neurosurgical procedures, should all be carried out long before large doses of opiates are required. As a general rule these various procedures are indicated in the care of patients with otherwise intractable pain and with an expectation of life of at least a few weeks when the lesser procedures are employed or a few months when the more complicated procedures are employed.

When new medical or surgical conditions develop in a patient with advanced malignant disease it is wiser at first to assume that they are not due to spread of the cancer. Otherwise, lack of attention to the diagnosis may result in some benign condition being accepted as incurable.

The euphoric effect of alcohol should not be overlooked in relation to these patients, and in the terminal stages I used to prescribe small doses of *Cannabie Indica* for the same reason, but this is no longer available.

Conclusion.

In conclusion it must be emphasized that the management of patients in whom advanced carcinoma has reached an incurable stage is just as important and just as worthy of attention as that of other patients suffering from some so-called benign condition such as congestive cardiac failure.

THE CAUSES OF DELAY IN OPERATION FOR ACUTE APPENDICITIS.¹

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THERE is only one treatment for acute appendicitis, and that is early operation. This can be performed only if the disease is diagnosed while it is still in an early stage, before the pathological process has spread beyond the appendix. Such an operation is attended by no mortality and little morbidity, and the figures of individual surgeons, both at home and abroad, tend to make one believe that such an ideal treatment has been universally attained. However, this is far from the truth, because often patients still are admitted to hospital with acute appendicitis, not of hours' duration, but of days' duration. The statisticians also report a disturbing picture. In New South Wales in 1953 there were 61 deaths assigned to acute appendicitis (Government Statistician of New South Wales, 1955, personal communication). In the United States of America, in 1952, there were 2600 deaths from this cause (1.7 per 100,000 of population) (Boyce, 1954), and in England, in 1950, there were 1300 deaths (Editorial, 1953). These figures, of course, give no indication of the morbidity of late operations for acute appendicitis, or of the mortality of late complications such as acute intestinal obstructions.

Why is it, then, that this common lesion still has such comparatively high and unnecessary mortality and morbidity rates? Delay in operation is the only answer to this. Delay allows the inflammation to spread beyond the appendix, thus permitting a case of simple early acute appendicitis to become a late complicated one with its higher mortality and morbidity.

What, then, are the reasons why a patient with early acute appendicitis does not undergo prompt operation? The following are the two main ones:

1. There may be delay in the patient's reaching medical attention. This is very real. Hindmarsh (1954) found that five out of six children reached hospital late because of delay in the parents' sending for the doctor. In adults, too, unless the attack starts violently, delay in sending for the doctor occurs because the patient thinks that the attack will subside, as it may have done previously. Associated with the delay, especially in children, is the attempt at home treatment with some one or other type of purgative, which always hastens the pathological process.

2. There may be delay due to the medical attendant. This may be considered under two headings, the first of which is as follows: (a) The diagnosis is correctly made, but the doctor delays operation by treating the patient with antibiotics, a modern type of so-called expectant treatment.

Whilst no one cavils at the exhibition of the antibiotics post-operatively if the infection has spread beyond the appendix, their pre-operative use is dangerous, as not only does it delay operation, but it confuses the diagnosis and masks rupture of the appendix with its resultant peritonitis. Antibiotics may control the clinical manifestations of the disease while masking the progressing pathological process. They may turn a frank acute disease into a chronic insidious, though no less dangerous, disease.

¹Based on a paper read at a meeting of the Section of Surgery, Australasian Medical Congress (British Medical Association), Ninth Session, Sydney, August 20 to 27, 1955.

There is no justification at all for exhibiting antibiotics as an excuse to delay surgical treatment. These remarks are well illustrated by the following case report, which is more or less typical of several such patients treated over the past few years by the writer.

The patient was a man, aged fifty-six years, who for many years had been under treatment for a supposed duodenal ulcer, which from time to time caused attacks of moderate to severe epigastric pain with vomiting. Actually the ulcer was never demonstrated radiologically, an "irritable duodenal cap" only ever being found. This final attack commenced with vague generalized abdominal pains, at the commencement of which the patient vomited once. He was treated with penicillin and streptomycin for three days, during which period his condition improved a little, though his appetite was poor. His bowels were well opened with normal motions and there was only vague generalized abdominal tenderness with no distension. Bowel sounds were present. However, he did not look well, and his temperature ranged from 99° to 101° F., his pulse rate being 80 per minute. On the fourth day surgical opinion was sought. The patient was seen to be quite well, though with a furred tongue and a temperature of 101° F. Abdominal examination revealed only slight generalized tenderness. There was no rigidity or distension. A rectal examination revealed no abnormality.

On the following day he vomited again, and this time some lower abdominal distension was noted. The patient was constipated now.

On the next day, the fifth of his illness, his general condition was the same, but his abdomen suddenly began to show generalized distension, which became gross, and was not unlike that of a chronic large bowel or partial ileal obstruction. There was no tenderness or rigidity, but no bowel sounds were heard. The patient was moved to hospital, where X-ray films showed some fluid levels and generalized distension of the small and large bowel.

Operation was then performed, after appropriate pre-operative gastro-duodenal suction plus intravenous therapy had been instituted, the provisional diagnosis being a sub-acute intestinal obstruction of unknown cause. There was found a grossly acutely inflamed appendix which was not obstructed, nor had it perforated. General peritonitis was present, all the bowel being reddened and inflamed, and covered with thick fibrinous plaques. However, no free fluid was present. The appendix was removed and the abdomen was closed without drainage. Convalescence was fortunately uneventful after the use of stomach suction and fluid replacement therapy. However, for the remainder of his life the patient will always run the risk of intestinal obstruction due to adhesions.

This case shows how insidiously peritonitis can occur when masked by the antibiotics. These should never be given in cases of abdominal pain until the diagnosis is certain, and they usually will not be necessary until perhaps after operation.

- (b) The second of the two ways in which the medical attendant causes delay is that the doctor may delay operation because he fails to recognize early acute appendicitis owing to diagnostic difficulties. This latter is the most important cause of delayed operation in acute appendicitis, and there are two main reasons for this. Firstly, there is still a lack of appreciation of the fact that acute appendicitis is common at all ages from infancy to old age, and hence must be considered first in any acute abdominal emergency at any age. It was once taught that it is uncommon in children and the elderly, so that it was apt to be placed last on the list of differential diagnoses instead of first, as it should always be. Secondly, delay is caused because an attack of abdominal pain and tenderness does not conform to the so-called "classical" clinical picture of acute appendicitis, in which central abdominal pain radiates to the right iliac fossa and is accompanied by tenderness there. As a result, the clinician may diagnose some other condition erroneously and operation consequently may be delayed.

It is not always well realized that the symptomatology of acute appendicitis is dependent on the position of the caecum and appendix and on the length of the latter. Though it is now well known that the caecum and consequently the appendix occupy positions other than in the right lower abdominal quadrant, and that even if the caecum is in this quadrant the distal part of a long

appendix (the only part which may be inflamed) may be almost anywhere in the abdominal cavity including its left side, nevertheless, the traditional clinical description of acute appendicitis is assumed by many to be its typical manifestation. Any departure from this is said to be "atypical". Actually, this supposedly typical clinical picture occurs only when the inflamed portion of the appendix is situated in the right lower abdominal quadrant in front of the ileum (or caecum), and this occurs in only 1% of the human race. Consequently, the classical clinical picture is far less common than has hitherto been realized.

Wakeley and Gladstone (1928) pointed out that most appendices are either retrocaecal in position or lie in the pelvis. (Usually found near the psoas muscle, this appendix may be described as being in the "high pelvic" position.) It is when the appendix is found low in the pelvis or high on the right side of the abdomen or anywhere on the left side of the abdomen that diagnostic difficulties ensue (Rose, 1955). Such unusual positions of the appendix are dangerous not only because they may cause diagnostic difficulties, but because the inflamed organ may mimic acute disease of an adjacent viscus whose correct treatment may be non-operative.

SYMPTOMATOLOGY OF EARLY ACUTE APPENDICITIS.

There are three important symptoms and signs which are the main ones to consider in the diagnosis of early acute appendicitis. These are the symptom of pain, and the signs of tenderness and a change in bowel function. In most cases all three are present and make the diagnosis, if not that of early acute appendicitis, at least that of an acute abdominal emergency, a certainty. In some cases, however, whilst pain is present always, either tenderness or change in bowel function may be minimal or even absent, so that the diagnosis is made more difficult.

Apart from these three important manifestations, other symptoms and signs are merely of ancillary use in the diagnosis of acute appendicitis, their presence helping towards it, but their absence not detracting from it.

The Important Symptoms and Signs.

Pain and Tenderness.

The early sequence of events when the appendix becomes inflamed or obstructed is that the rise in tension within the organ causes visceral pain. This is present as the initial symptom in the obstructive form of appendicitis, but in acute catarrhal appendicitis of blood-borne origin it may be preceded by constitutional disturbances such as nausea and vomiting. It is not localized accurately to the appendix, but is felt over a wide area of the abdominal wall, varying from patient to patient according to the level of the site of the appendix. It may be generalized over the whole of the anterior abdominal wall or some area in the centre of the abdomen. In this latter case, the pain may be felt in the epigastrium, in the peri-umbilical region or in the hypogastrium, according to whether the appendix is situated high up in the abdominal cavity, in the lower quadrant (right or left) or in the pelvis respectively.

Accompanying this pain is visceral tenderness which, in contradistinction to visceral pain, is accurately localized to the appendix itself. It is elicited when the inflamed appendix can be pushed by the examining finger, and consequently its position will vary according to wherever the appendix is situated. Thus it does not necessarily coincide with the position of the visceral pain. In an inflamed pelvic appendix, for instance, the visceral pain is hypogastric in position, whereas the visceral tenderness may be elicited only on rectal or vaginal examination.

The intensity of the tenderness is variable and is dependent on what structures lie between the appendix and the examining finger. These structures may protect the appendix from the examining finger and so dampen down the intensity of the response or even completely abolish it. The thick subcutaneous fat of the obese patient, or thick omentum wrapped round the appendix, may prevent any tenderness from being elicited, just as in a retrocaecal

or a retromesenteric appendix the bowel in front of it may so well protect it that little or no tenderness can be elicited through the anterior abdominal wall. In a low pelvic appendix, visceral tenderness may be found only on pelvic or rectal examination. Sometimes the appendix may be approached indirectly, and pain (really tenderness) accentuated by pressure on the colon on the left side causing retrograde distension of the caecum with involvement of the appendix, as in the case of the fixed retroileal appendix.

Now if the early inflamed appendix is later able to irritate the parietal peritoneum of the anterior abdominal wall, the pelvis or the posterior abdominal wall, then somatic pain and tenderness localized to the part affected is experienced by the patient. Thus an appendix in the lower right abdominal quadrant will cause somatic pain and tenderness in the right iliac fossa, with perhaps voluntary muscle guarding on palpation. Thus, as far as the patient is concerned, the pain radiates from the original situation of the vague visceral pain to its new position as localized somatic pain. The speed of this radiation naturally depends on the tempo of the pathological process. On the other hand, the patient's visceral tenderness, which was localized to the appendix, now has become more widespread somatic tenderness localized to the area of involved parietal peritoneum.

The intensity of the first or visceral pain in acute appendicitis may be mild, even though the appendiceal inflammation may be very acute, and vice versa, so that it is a bold surgeon who will describe the exact pathology of the appendix before operation. Sometimes, however, the visceral pain is so severe as to be agonizing, and it may mimic the pain of an acute small bowel volvulus or intussusception and be associated with shock and collapse. Such a pain may cause so much writhing and groaning on the part of the patient as to create the suspicion of hysteria. In such a case, pus is present in the appendix under tremendous tension—a situation which can arise within a matter of two or three hours.

Though appendiceal pain usually becomes increasingly severe, occasional patients are seen whose pain waxes and wanes, so that misdiagnosis may occur. This is important in some hospital admissions, when the doubtful surgeon may examine the patient when the pain has temporarily waned. The referring practitioner in his letter is emphatic on the diagnosis, having seen the patient when the pain was severe. Full notice must be taken of his opinion.

Changes in Bowel Function.

Changes in bowel function depend on the relationship of the appendix to the bowel. If the inflamed appendix does not irritate the bowel, the motions will be normal or the patient may be constipated. On the other hand, if the appendix is apposed to and irritates the terminal portion of the ileum, then the motions will be more frequent and softer than usual, but not diarrhoeal. When the caecum or the colon is irritated, there will be diarrhoea and sometimes the passage of unusual amounts of flatus. When the rectum is irritated, then spurious diarrhoea, that is the passage of mucus with tenesmus, will occur. These changes in bowel habits may occur very early, even before the onset of pain.

Diarrhoea may be caused, too, by the unnecessary and dangerous practice of giving purgatives in cases of undiagnosed abdominal pain.

Diarrhoea, associated with intestinal colic, is a dangerous symptom because, especially in children, there is always a risk in epidemics of gastro-enteritis that one of these patients may actually have acute appendicitis, which may be missed (Rose, 1945b).

Ancillary Symptoms and Signs of Little Consequence in the Diagnosis of Early Acute Appendicitis.

The presence of ancillary symptoms and signs may serve to confirm the presence of acute appendicitis. Their absence is of no consequence in its diagnosis. Nevertheless, one often hears remarks that a high temperature, or a normal temperature, or a high pulse rate, or a slow pulse rate, is

a point for or against the diagnosis of early acute appendicitis; of course, they are nothing of the sort.

Nausea and Vomiting.

Nausea and vomiting, which, it has been pointed out, may precede the onset of the pain, are very variable and depend to a great extent on the temperament of the patient. In young children who vomit easily and frequently, one must beware of the diagnosis of "gastric upset" or "dietetic indiscretion" before ruling out appendicitis.

Temperature.

The temperature may vary from subnormal to hyperpyrexial (even up to 105° F.), and with this latter, chills and sweats may occur.

Pulse Rate.

The pulse rate may be slow or fast; it usually varies with the temperature, as, too, does the respiratory rate.

Condition of the Tongue.

The tongue may, or may not, be furred. The breath may, or may not, be offensive. The so-called "appendiceal breath" is a very weak proof indeed on which to lean the diagnosis.

Hyperæsthesia.

Hyperæsthesia is not a good diagnostic sign, as it may be absent in many cases of early acute appendicitis.

Flushed Facies.

Some patients, especially children with rapidly evolving acute obstructive appendicitis, have a characteristic hectic flushing of the cheeks, just as did the patients of other days with lobar pneumonia. The sign, if present, is of diagnostic value.

Pathological Investigation.

Pathological investigation is of little help in the diagnosis of early acute appendicitis, though it may help to exclude other conditions.

Pyuria.

Pyuria may be present, though not very pronounced, if the appendix is close to the ureter or bladder, and its presence should never be used against the diagnosis of appendicitis unless there is unequivocal evidence of urinary disease. It must be remembered that acute pyelitis, with no other evidence of renal disease, produces heavy pyuria, the urine swarming with motile *Bacterium coli* organisms, and the condition is bilateral. The findings must be very characteristic before the diagnosis of acute pyelitis is made before that of acute appendicitis.

Leucocyte Count.

Leucocyte counts are of little use in deciding on the diagnosis, because in the presence of an acutely inflamed appendix, in its early stages at least, there may be a normal leucocyte count or even neutropenia. Indeed, this may also occur in general peritonitis.

Radiological Findings.

Radiographic examination of the abdomen, apart from excluding other conditions and obvious disease of the genito-urinary tract, is of little use during an acute attack. It may show up calcified fecoliths, which are, however, very rare. Nevertheless, their demonstration can cause confusion in the minds of the unwary, because if they are in the line of the ureter as shown on an antero-posterior radiograph, the presence of a ureteral calculus may be diagnosed if the symptoms have been equivocal. A lateral view must always be taken to show the relationship of the shadow to the line of the ureter. These calcified appendiceal calculi may become laminated, and in the case of a high appendix may mimic radio-opaque gall-stones on the radiographs (Rose, 1955).

SOME CLINICAL SYNDROMES OF EARLY ACUTE APPENDICITIS.

Thus it may be seen that, especially as far as the three cardinal symptoms and signs—pain, tenderness and a change in bowel habit—are concerned, the symptomatology of early acute appendicitis may vary according to the position of the appendix and its relationship to the bowel. In addition, other factors such as the presence of other diseases may alter the symptomatology, making the diagnosis difficult and thus causing a delay in operation.

These varying symptoms may be grouped into certain more or less characteristic syndromes of early acute appendicitis depending on the following factors: (i) the position of the inflamed appendix; (ii) the presence of a pregnant uterus; (iii) the presence of other diseases; (iv) the occurrence of appendicitis with few or no localizing signs or symptoms; (v) its occurrence when the appendix is supposed to have already been removed; (vi) its origin from a blood-borne infection.

The Position of the Appendix.

1. The appendix may be situated in the right lower abdominal quadrant in front of the terminal portion of the ileum or the caecum, so that it is in close relationship to the peritoneum of the anterior abdominal wall. The visceral pain is round the umbilicus, with visceral tenderness in the right iliac fossa. The pain radiates to the right iliac fossa as somatic pain due to irritation of the closely apposed parietal peritoneum. Diarrhoea may occur if the caecum is irritated. This is the so-called "classical" appendicitis.

2. The appendix may be retrocaecal, the caecum being situated in the right iliac fossa. In such a case the visceral pain is periumbilical, and the later somatic pain is felt in the right loin, as the caecum stops the appendix from irritating the parietal peritoneum of the anterior abdominal wall, but allows it to affect that of the posterior abdominal wall (or the muscles if it is extraperitoneal). For the same reason, accompanying visceral and somatic tenderness is also best elicited in the loin and may not be felt anteriorly except sometimes on deep pressure through the caecum. If the psoas or iliacus muscles are irritated, the right lower limb may be flexed at the hip joint, and the pain made worse on its extension. The patient may also walk with a limp, so that superficially hip joint disease may be mimicked. Diarrhoea is common in these patients.

3. The appendix may be situated high in the right side of the abdomen. Here, either the caecum is undescended, or a long appendix stretches up in front or behind or beside the caecum and ascending colon, and comes close to the kidney, the gall-bladder or even the duodenum. The visceral pain is felt in the epigastrium, and the somatic pain in the right subcostal area. Tenderness is subcostal, and here acute cholecystitis may be mimicked and disaster may occur if, as a consequence, the condition is treated conservatively. If the tenderness is high in the loin, as it may be if the appendix is behind the caecum and ascending colon, then right-sided renal disease may be mimicked. At times, though rarely, if the inflamed portion of the appendix is apposed to the duodenum, hæmatemesis and melæna may occur. Diarrhoea almost invariably accompanies a high right-sided inflamed appendix, because it is in apposition to both the caecum and the ascending colon.

4. The appendix may be situated low in the pelvis. Here symptoms of inflammation differ according to the sex of the patient.

In the male, the visceral pain is hypogastric, with radiation to the penis from prostatic irritation. This is associated with frequency of micturition and dysuria. The rectum may be irritated, with resulting pain in the rectum, tenesmus and spurious diarrhoea. If the peritoneum in the recto-vesical pouch is irritated, then somatic pain may be experienced in the perineum. In both sexes, the obturator muscle on the right (or at times on the left) side may be irritated by the adjacent appendix, so that pain is intensified on internal rotation of the hip and the patient may limp. Visceral tenderness may be found only when the low appendix is pushed through the rectum. Very little abdominal tenderness may be found.

In the female, uterine bleeding and vaginal discharge may occur if the inflamed appendix is close to an ovary or the uterus. If an ectopic gestation is mimicked, as is not uncommon, especially when the inflamed appendix can be felt as a tender mass *per vaginam*, no harm is done, because immediate operation is the correct treatment for both lesions. However, the patient may be treated conservatively owing to a mistaken diagnosis of right-sided salpingitis, with disastrous results. Acute gonococcal salpingitis, which may be correctly treated conservatively, is now very rare, and is bilateral when it does occur. Acute unilateral right-sided salpingitis is due to other causes, such as an adjacent inflamed appendix, and always requires immediate operation.

5. The appendix may be situated behind the terminal portion of the ileum or its mesentery. The inflamed appendix here may cause diagnostic difficulties by presenting itself in one of two ways: (i) It may mimic an acute ileal obstruction from the commencement of the illness (Rose, 1954b). There is colicky visceral generalized pain, but only vague visceral tenderness. Somatic pain and tenderness are not present. Constipation is present. Plain X-ray films of the abdomen reveal fluid levels in the terminal portion of the ileum. Fortunately, in such a case early operation will be performed, because an acute ileal obstruction will have been diagnosed. (ii) The appendix may be tethered behind the terminal portion of the ileum—the so-called "tethered retromesenteric appendix". Kerr (1955) pointed out how difficult is the diagnosis of early acute inflammation in such an appendix, because it is fixed behind the terminal portion of the ileum. Symptoms are referable to irritation of the terminal portion of the ileum. They are diffuse abdominal pain due to appendiceal visceral pain, with minimal or even absent visceral tenderness due to the position of the appendix behind the terminal portion of the ileum. Somatic pain and tenderness are absent. The irritated ileum itself is hyperactive, so that borborygmi can be heard. Diarrhoea is absent, but there are frequently passed soft motions. Diagnosis thus may be very difficult indeed; but any tenderness, however minimal, should put the diagnostician on his guard that an acute abdominal emergency is present.

6. The appendix may be situated on the left side of the abdomen. The left-sided appendix may occur in one of three ways (Rose, 1955): first, when there is transposition of viscera; secondly, when the bowel is malrotated so that the caecum is on the left side of the abdomen (high up or low down); thirdly, when an abnormally long appendix stretches across to the left side of the abdomen from a caecum situated in the right iliac fossa. Inflammation of the appendix in the first two instances and in its distal portion in the last will cause left-sided abdominal symptoms. There will be, first, the usual generalized or central visceral abdominal pain at a height depending on the level of the appendix, with visceral tenderness directly over the appendix on the left side of the abdomen (or on the left side of the rectum in the case of the low left pelvic appendix). This will be followed by somatic pain and tenderness on the left side of the abdomen or in the left loin, according to the parietal peritoneum to which the appendix is in close relationship. The left-sided appendix is usually in close proximity to the descending colon or pelvic colon, so that diarrhoea is common in these patients.

7. The appendix may be situated in a hernial sac. The inflamed appendix in a hernial sac stimulates strangulation of an external hernia in the case of an inguinal or a femoral hernia, or of an internal hernia in the case of an obturator hernia. Consequently operation will be performed early even if the pre-operative diagnosis is not correct (Rose, 1954a).

The Presence of a Pregnant Uterus.

Delay in diagnosis in the presence of a pregnant uterus occurs because the clinician naturally first assumes that abdominal pain is due to disease of the gravid uterus or its appendages.

It is well known, too, that as the uterus expands, the caecum and appendix are pushed up, so that when inflam-

mation occurs the symptoms referable to highly placed appendicitis occur. These mislead the clinician into thinking that he is dealing with gall-bladder or renal disease which may allow of conservative treatment.

If there is any doubt at all operation should be performed; otherwise there is a risk that the infection will spread beyond the appendix, with the possibility of uterine abortion and fulminating peritonitis.

The Presence of Other Diseases.

Early acute appendicitis may occur in patients who have undergone bilateral sympathectomy for hypertension. In patients who have had a bilateral thoraco-lumbar sympathectomy, the subjective feelings of visceral pain carried in the splanchnic nerves may be absent, whereas the somatic pain due to inflammation of the parietal peritoneum remains constant. Such a patient may be ill with vomiting and no abdominal pain at first, until continuous somatic pain occurs wherever the parietal peritoneum is irritated. Visceral tenderness is absent, and somatic tenderness cannot be elicited until the parietal peritoneum is involved.

Early acute appendicitis may occur in a patient with ascites or with pneumoperitoneum. In a patient who has ascites due to any cause, or whose pulmonary tuberculosis is being treated with a pneumoperitoneum, whilst the visceral pain of acute appendicitis is present early as usual, visceral tenderness may never be felt, because the appendix is cushioned from the examining finger by fluid or air as the case may be. Not until it ruptures into the ascitic fluid causing rapid general peritonitis do widespread somatic pain and tenderness occur.

Its Occurrence with Few or No Localizing Symptoms.

In spite of the clinician's knowledge of all these not uncommon variations in the symptomatology of acute appendicitis, it must be admitted that early diagnosis may still be missed. Especially is this so in the case of the very young, in whom, with no obvious premonitory signs except perhaps a little fretfulness and refusal of food, the first sign is the finding of a mass in the region of the appendix, which may be movable or fixed. Such a "silent abscess" can occur, too, in the old, as may also an apparently causeless pyelophlebitis due to a symptomless ruptured appendix.

In spite of what is often said, there is nothing peculiar in the pathology of acute appendicitis in young children or in the aged as compared with that of other age groups. It is simply that it is more difficult to diagnose, and hence correct treatment is delayed.

Its Occurrence When the Appendix is Supposed to Have Been Previously Removed.

It is necessary to refer to the group of patients whose appendix is supposed to have been removed, owing to the widespread migration of peoples in these modern times. Such persons present themselves with pain and tenderness in the right iliac fossa where there is already a surgical incision, usually of some years' duration. These patients invariably have no knowledge of what was done to them at the prior operation. Such patients require exploration even if the appendix was thought to have been removed, because an abscess only may have been drained, and the patient not have been warned of the later necessity for removal of the appendix. Perhaps, too, a portion of the appendix as a faecolith from a ruptured appendix was left in the peritoneal cavity, now causing an abscess (Rose, 1954a). Perhaps, even though the appendix was removed, some other condition is now present, such as torsion of an epiploic appendage of the ascending colon.

Its Origin from a Blood-Borne Infection.

Whilst the foregoing syndromes of the early acutely inflamed appendix refer to either the acutely obstructed or catarrhally inflamed appendix, whose infection, originating in the appendiceal lumen, commences in the mucosa, acute appendicitis due to a blood-borne organism has features

unlike them, and is really a clinical entity of its own so deserving special consideration.

In most of these cases, the original focus of infection is unknown; but the abdominal pain may be preceded by generalized malaise, rigors, headaches and backaches, nausea and vomiting during the bacteriæmic phase of the illness. If the infection arises from some obvious focus of infection, such as may be found in the upper portion of the respiratory tract, a "sore throat" or tonsillitis may be followed by the abdominal symptoms some two or more days later. In an epidemic of such an illness, some patients may suffer from abdominal pain with diarrhoea, and there may be great difficulty in deciding at first whether this is due to the effects of the broad spectrum antibiotics used for treating the throat infection, or to appendicitis.

The infection starts first in the outer layers of the appendix, thus causing little tension, and hence visceral pain and tenderness may be minimal. In fact, the first pain experienced may be somatic pain and pain from irritation of the parietal peritoneum. Thus if the appendix is in the right lower abdominal quadrant and apposed to the parietal peritoneum, the attack may commence with parietal pain and tenderness in the right iliac fossa, so disproving the old adage that pain commencing in the right iliac fossa is probably not due to appendicitis.

Summary.

Thus, to summarize, in dealing with these patients who come under the category of the "acute abdomen", three wise observations that have stood the test of time should be remembered, namely: (i) Abdominal pain of ever-increasing intensity is a surgical emergency until proved otherwise. (ii) The surgeon faced with an abdominal emergency should consider acute appendicitis first, last and all the time. (iii) The clinician should realize that it is often much more essential to make the correct decision as to whether or not to operate, than it is to make the correct diagnosis.

THE PROPHYLAXIS OF ACUTE APPENDICITIS.

As prevention is always better than cure, it is not out of place to see whether the onset of acute appendicitis can be prevented. This is possible in many instances, as will be shown below.

Many patients suffering from acute appendicitis have had previous warnings in the form of recurrent appendiceal colic due to faecoliths, or recurrent subacute appendicitis (Wass, 1955) of varying types and intensities of pain, with or without vomiting. These patients, more often than not, have been diagnosed as having had "appendicitis attacks", and may even be on a hospital waiting list for appendicectomy. These attacks usually subside quickly and give no cause for alarm until one does not subside and needs urgent operation. All such appendices causing these early premonitory symptoms should be removed, as this stops the attack and prevents the onset of acute appendicitis.

These attacks are not difficult to diagnose when the appendix is in one of the more usual positions—for example, the right lower abdominal quadrant—when generalized or central abdominal pain will be present with tenderness in the right iliac fossa. It is when the situation of the appendix is less usual—as, for instance, high in the abdomen, and especially if it is behind bowel—that difficulties in diagnosis occur, so that the appendix is not at first implicated as the real culprit. When the appendix is in a high, retrocolic position and the pain is confined to the epigastrium and tenderness is minimal and difficult to localize, a duodenal ulcer may be diagnosed, especially if the radiologist is able to demonstrate an "irritable duodenum". Upper abdominal pain with tenderness in the right hypochondrium from a high appendix is attributed to the gall-bladder, especially if a "poorly functioning gall-bladder" is revealed radiologically. Similar attacks of pain associated with diarrhoea are diagnosed as recurrent colitis or dysentery, even if stool cultures produce no pathogenic organisms.

However, sooner or later an attack of acute appendicitis occurs, commencing as before, but going on to the full-

blown picture, so that the appendix is at last correctly blamed and removed; this cures the alleged duodenal ulcer, chronic cholecystitis or colitis.

The danger in many such cases of prolonged symptomatology is that an acute attack is sometimes heralded by symptoms no more intense than previously, and before the patient or his doctor realizes it, a gangrenous appendix is present. However, though the pain may not be increased at the acute attack, which misleads the patient, the clinician will usually find tenderness, which is the sign *par excellence* on which to decide to operate.

The subject of recurrent generalized abdominal pain in children, often associated with vomiting, is of perennial interest. The important thing is to realize that the majority of these pains are due to recurrent appendiceal colic for which the appendix should be removed.

All patients with these recurrent abdominal pains, in addition to the radiological examination of the stomach and duodenum with an opaque meal, should have a "follow-through" examination performed. Invariably a "non-filling" appendix will be found, more often than not associated with tenderness in the region of the caecum. Once this is found, it means that an abnormal appendix is present which should be removed.

CONCLUSIONS.

It is still necessary to educate the lay public as to the seriousness of abdominal pain, and to the danger of giving purgatives to patients with abdominal pain.

It is essential, too, to teach that prompt operation is still the treatment of early acute appendicitis, that expectant treatment is a compromise to be used only when, for some reason, operation is not available, and that antibiotic therapy is only an adjunct to surgery and cannot replace it.

SUMMARY.

Early operation is the treatment of acute appendicitis.

The mortality of acute appendicitis is still too high, and this continuing mortality is due to several factors. Whereas removal of an appendix whose inflammation is still localized to it should be attended by no mortality (and little morbidity), these varying factors, all of which cause delay in operation for removal of the appendix, allow the inflammatory process to spread beyond the appendix, and this is the cause of the continuing mortality of this disease.

The main factors delaying operation are caused by difficulties in the diagnosis of early acute appendicitis. These are discussed, and it is pointed out that the combination of pain, tenderness and change in bowel function is all that is necessary for the diagnosis of early acute appendicitis requiring immediate operation.

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A FRENCH FOLLOW-UP OF RESEARCH CARRIED OUT IN 1912 BY DR. A. L. MACLEAN, OF THE AUSTRALASIAN ANTARCTIC EXPEDITION, 1911-1914, ON THE SLOWING DOWN OF THE GROWTH OF HAIR AND NAILS IN ANTARCTICA.

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AND

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THE scientific and technical publications of the Australasian Antarctic Expedition, 1911-1914, at Cape Denison under the leadership of Sir Douglas Mawson, were a precious guide to the first French expedition which followed it in Adelle Land in 1949-1951. The men of the Australasian expedition were our sole predecessors in this quadrant of Antarctica, and all that we knew of it we had gleaned from their work, to which we pay tribute.

The doctor and biologist of the French expedition appreciated very much the researches carried out nearly forty years earlier by the late Dr. A. L. MacLean. It is a well-known fact that hair and nails grow more slowly in cold climates, and Dr. MacLean was struck by the importance of this phenomenon during the winter of 1912 and 1913. Therefore, among research observations at the French base of Port Martin, 40 miles west of Cape Denison, it seemed interesting to study the matter again and compare respective findings.

The slowing down of the growth of hair and nails was very pronounced during the first weeks of our stay in Adelle Land, when we were living and sleeping without heating in temperatures varying from zero to -15°C . But any measure was impossible during that period of landing and base building. The measurements were made in winter when the team was living in a normally heated base, going out only for short periods in temperatures of -15° to -35°C . The slowing down of the growth under these circumstances was not so evident as at the beginning of our stay.

Here we propose to deal with the technique of the measurements, to compare MacLean's results with ours, and to discuss the significance of the phenomenon.

Technique of Measurements.

The technique of measurement presents difficulties. Many authors, without any details on their measurement technique, give very different figures. For example, MacLean takes as normal, for the growth of nails of the third finger in temperate regions, the figure of 0.812 millimetre given by MacLeod, while for the French authors, Giroud and Bulliard (1930), the normal rate is 0.125 millimetre, which is six times less.

MacLean estimated the growth of nails by measuring every week with a micrometer the distance between a line drawn on the nail and the cuticle. In the case of the hair, he isolated one hair by shaving the head and measuring its length at various intervals, using a micrometer giving a precision of one one-thousandth of an inch (0.025 millimetre). He does not state how he put the isolated hair in a straight line for the measurement.

Basler (1937), a German author, studied the hourly speed of growth of nails and hair in order to know the daily cycle of this speed. He stuck a piece of brass on the nail, stuck another piece of brass on the skin of the dorsal face of the distal phalanx, and read the distance between the two pieces of brass every hour with a microscope. But the finger is never motionless enough for the reading, and Basler was obliged to invent and build a special optical system which he calls a "biomicrometer". With this apparatus he was able to measure the distance with the precision of one one-thousandth of a millimetre (one four-thousandth of an inch) (Figure I). To measure the hourly

growth of hair, Basler had a wooden cage fixed around the head of the subject and the "biomicrometer" fixed on the cage. He does not give details on the measurement and the means of maintaining a hair in a straight line without its being lengthened by traction.

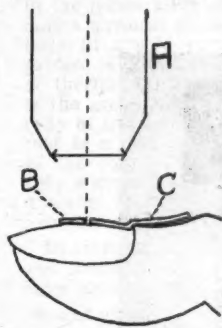


FIGURE I.

Basler's technique for the measurement of hourly nail growth by the use of the "biomicrometer" (A), measuring with a precision of one one-thousandth of a millimetre. Measurement of the increasing distance between two marks—one stuck on the nail (B), the other on the dorsal skin of the finger (C)—made in relation to the skin.

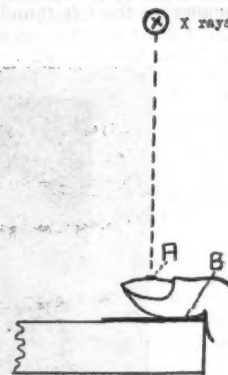


FIGURE II.

Technique used in Adelle Land by Sapin-Jaloustré. Radiograph of the second phalanx of the left thumb. A metallic mark (A) has been adjusted on a permanent mark made on the nail with a razor blade. Measurement is made in relation to the bone. B, dental X-ray film.

In Adelle Land we, of course, had no "biomicrometer". It was necessary to operate over long intervals of time in order to measure lengths as long as possible. With regard to nails, we thought that the cuticle was not fixed enough to be a good reference mark, because its position changes with the degree of skin hydration and with the wearing out of the cuticle. We decided to measure the movement of a mark on the nails in relation to the bone. We drew a fine line on the nail with a razor blade, and adjusted, with the help of a powerful microscope, a small piece of metal five millimetres wide on the line, and then took a radiograph of the finger every month (Figures II and III). It is simple and easy to measure the movement of the metallic piece in relation to the bone by projecting the radiograph, 20 times enlarged, on a screen. Precision is easily obtained to one-twentieth of a millimetre. The dimensions of the metallic mark immediately give the scale of projection.

In the case of the hair, we found, when trying to place a hair in a straight line, that it lengthened under traction, and the law of the lengthening was not known. It probably varies according to temperature, humidity *et cetera*. The measurement of a hair *in situ*, as MacLean measured it, appeared extremely difficult, and the base of the hair seemed not to be a precise reference mark. So we shaved an area at the back of the head, shaved it again two months later and collected a great number of hairs. There were differences between the diameters, the surfaces of the sections and also the lengths of the collected hair. Short hairs were those which had not been shaved close enough by the blade at the second shaving. Long hairs, on the contrary, were those cut far from the skin by the first shaving. But 80% of the hairs collected were nearly the same length, and their average length was considered as measuring the speed of growth. For measurement purposes, the hairs were placed between two glass slides and their image was projected on a screen, in their natural shape, enlarged 20 or more times. They were then measured on the screen easily and quickly by the use of a curvimeter giving a precision of half a millimetre on the screen and one-fortieth of a millimetre on the hair. It is

quick and easy with this technique to measure hundreds of hairs in order to obtain a reliable average.

Results.

Results of the measurements are shown in Figures IV and V. The growth of nails was studied from June to November on the left thumbs of four men.



FIGURE III.
One of the radiographs made according to the technique of Figure II. It is easy to measure, with a big enlargement, the movement of the metallic mark in relation to a point of the bone on the medial axis (extremity of the phalanx).

Nails.

The daily growth of nails varies from 0.071 millimetre in June in Subject I to 0.115 millimetre in Subject IV during the month of November. The average speed for each man is between 0.098 millimetre (Subject I) and 0.111 millimetre (Subject IV). The youngest man has the quickest growth. The average for the four men is 0.102 millimetre. If we accept for a temperate climate (France) the figure of Giroud and Bulliard (1930), which is 0.170 millimetre, the speed in Adelle Land is six-tenths of the speed in France.

Hair.

The growth of the hair at the back of the head is 0.350 millimetre in August-September and 0.340 millimetre from September to November in Subject I. The growth of pubic hair in the same subject is 0.250 millimetre in September and October. The hair at the back of the head in Subject III grows at the speed of 0.211 millimetre from June to September. The growth of the hair of the beard (region of the chin) is 0.250 millimetre during September-October in Subject III, and 0.325 millimetre in the same man on the ship during the return voyage in the temperate climate of the Pacific Ocean. The slowing down is again six-tenths.

If we consider the average of the measurement of hair growth in Adelle Land (0.278 millimetre) and the normal figure given for France by Derobert and Lebreton (1951), which is 0.450 millimetre, we find again a proportion of six to ten.

Because of individual differences, it would be good to measure the hair growth of numerous subjects to obtain more reliable figures, or to observe the same man in Antarctic and temperate climates; this latter procedure was possible only in the auto-observation of Subject III. But all measurements give the same results: nails and hair of the head and beard grow six-tenths less quickly in Adelle Land than in temperate climates.

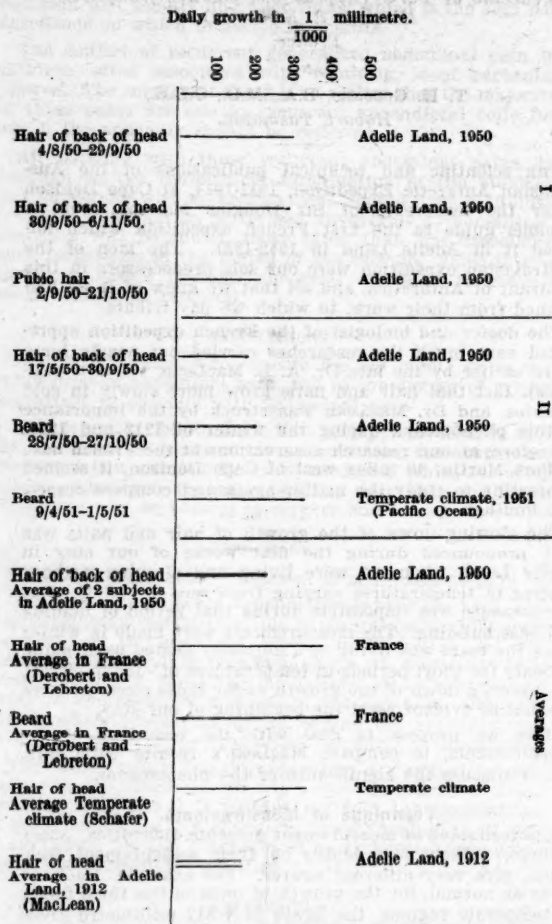


FIGURE IV.

Measurements of the growth of the left thumb nails of four men during the Antarctic winter of May to November. The horizontal lines represent: average daily growth for each period; average for each man for May-November; average of the four men for May-November; yearly average in France (Giroud and Bulliard, 1930); average found by MacLean in Antarctica in 1912.

Here are MacLean's results. For the nails of the third finger he found a speed of 0.089 millimetre per day, which would have become 0.121 millimetre for the thumb nail according to Giroud and Bulliard (1930), which is very near to our own figure. For the hair (region of the forehead), MacLean found an average of 0.149 millimetre, less than our own figure, 0.278 millimetre. In the MacLean measurements there is a discordance between slowing down of nail growth and hair growth.

The differences between MacLean's figures and ours could be easy to explain. The differences of measuring technique may play a part, but also the conditions under which MacLean's subjects lived were more severe than

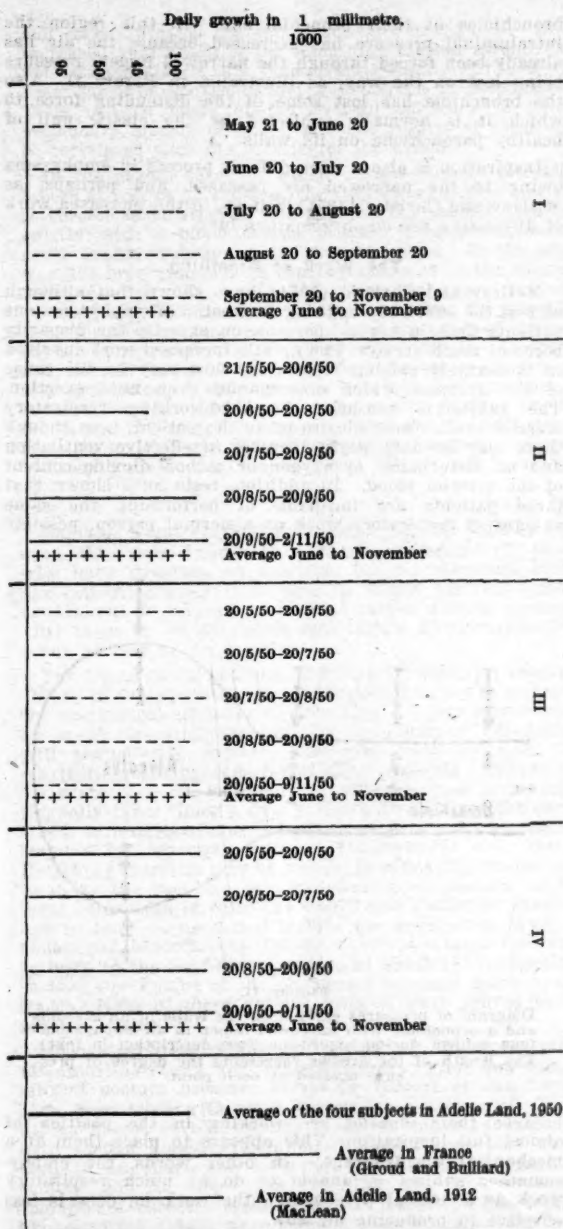


FIGURE V.

Measurements of hair growth in two subjects. Horizontal lines represent: average daily growth of hair at back of head and of pubic hair in Subject I in Adelle Land; average daily hair growth of Subject II in Adelle Land; average daily beard growth in Subject II in Adelle Land; and in temperate climate; average of the daily hair growth of the two subjects in Adelle Land; yearly averages in France for hair and beard (Derobert and Lebreton, 1951); average for hair given by Schafer (MacLean, 1919); average found by MacLean for hair in Antarctica in 1912.

ours were. The Australasian expedition's hut had a temperature near freezing point to avoid condensation on the walls and ceiling and the consequent "rain". On the contrary, our modern hut was well heated with an inside temperature of 7° to 14° C. Thus it is perfectly normal to

find a faster rate of growth in the conditions of our studies.

Significance of the Phenomenon.

The slowing down of growth of nails and hair in cold climates proves a diminution of the metabolism of the body's surface. The diminution is related to a lowering in the temperature of the body's surface. This drop is not only a physical phenomenon of loss of heat from a physical body in a cold environment. The cooling down of the surface is accepted and made easy by the vascular reactions of thermo-regulation, because this cooling of the surface is the great means of reducing the loss of heat from the body of the homeotherm. Many physiologists have shown that in a cold environment two thermal zones are formed in the body: (i) a cold "shell", whose temperature can vary a great deal in superior homeotherms and man; (ii) a warm "core" keeping the essential organs at normal temperature.

Measurements have been made of the two zones. Weltz and Reiter (1944), by calculation from thermometric and calorimetric measures in the guinea-pig, found that weight of core = 7.5 to 9; and for Edholm (1952) in man weight of shell

in thermic neutrality with an average skin temperature of 34° C. the "shell" is two centimetres thick and represents nearly half the weight of the body.

Kayser and Metz (1950), discussing Gagge's fundamental equation which expresses thermic exchange of man with his environment, write that "the physical thermo-regulation against cold is summed up in mechanisms reducing the skin temperature". So we can presume that if a real acclimatization to cold does exist, a permanent lowering of "shell" temperature must be one of the chief factors. We can interpret MacLean's and our measurements as a test of acclimatization to the cold of Antarctica.

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THE PHYSIOLOGY AND TREATMENT OF EMPHYSEMA.¹

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THE essential lesions in chronic hypertrophic emphysema of the lung are loss of elasticity, partial destruction of the normal alveolar pattern, and a degree of narrowing of the smaller bronchi and bronchioles. The last of these is more correctly due to the chronic bronchitis which almost always accompanies emphysema, but for convenience it

¹ Based on a paper read at the Anti-Tuberculosis Association of New South Wales Chest Clinic on February 23, 1956.

will be considered as part of the usual pathological complex. As a result of these changes the efficiency of breathing is affected in two ways: first there is a dysfunction of the interchange of air between the atmosphere and alveoli, and secondly there may be inadequate gas exchange between some of the alveoli and the blood in the capillaries of the lung.

The Mechanics of Respiration.

Figure I shows the respiratory air-flow in a normal and an emphysematous subject during (a) quiet breathing, (b) the estimation of vital capacity, and (c) the determination of maximal breathing capacity. The maximal breathing capacity is defined as the maximum volume of air that can be moved in and out of the lungs in one minute. It is one of the best indications of the capacity of the lungs to furnish an increased supply of oxygen to working muscles. From Figure I, in which inspiration is

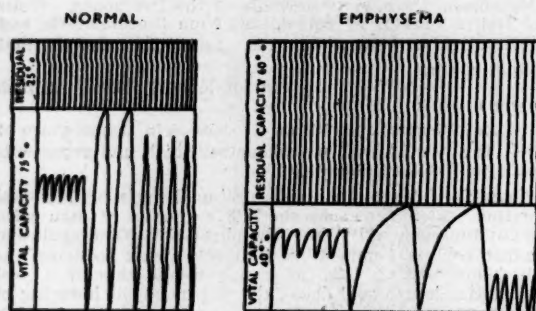


FIGURE I.

Schematic representation of lung volumes, usable part of vital capacity, and ventilatory capacity in a normal and in an emphysematous subject. (From Georg, 1952; reproduced by permission.)

recorded as a downstroke and expiration as an upstroke, it will be seen that in the normal person the rate of air-flow is rapid and uniform except at the end of full expiration, when the curve tends to flatten out very slightly. When this subject attempts to breathe as much air as possible per minute (c), he can use almost the whole of his vital capacity and still maintain a rapid rate of flow. However, in the determination of the vital capacity of an emphysematous subject, not only is the amplitude of the tracing greatly decreased, but the rate of flow is greatly and progressively slowed in the second half of expiration. This is well shown in Figure I. This portion of the expiratory act is obviously uneconomical in its flow-time relationship, and so in the test for maximum breathing capacity the emphysematous patient uses only that part in which the flow is relatively rapid. This results in respiratory movements of small amplitude near the full inspiratory position. This type of breathing entails increased muscular work, as will be discussed below, and there is obviously a greatly diminished maximal breathing capacity.

The difficult expiration in these cases is due to several factors. First, the elastic recoil of the lung is lost, and so expiration becomes an active process with the chest muscles contracting forcibly so as to squeeze the air out of the lung. But the diaphragm has no power of active movement upwards, and unless it is pushed up by intra-abdominal pressure greater than the intrathoracic pressure it remains immobile or exhibits paradoxical movement. Second, there is increased resistance to air-flow in the respiratory passages, which are more narrowed during expiration, and greater force is necessary to expel the air. Finally, a point is reached at which further increase of expiratory effort has no effect on the speed of air flow (Fry *et alii*, 1954). These workers and Dayman (1951) also suggest that the reason why the lung cannot be compressed to the normal position of full expiration is that the force required causes collapse of the soft-walled

bronchioles at their bronchial end. In this region the intraluminal pressure has decreased because the air has already been forced through the narrowed lumen, pressure being lost on the way, as illustrated in Figure II. Also the bronchiole has lost some of the distending force to which it is normally subjected by the elastic pull of healthy parenchyma on its walls.

Inspiration is also a more difficult process in emphysema owing to the narrowed air passages, and perhaps, as McIlroy and Christie (1954) believe, to the increased work of distending the emphysematous lung.

The Work of Breathing.

McIlroy and Christie (1954) have shown that although at rest the effort of breathing is greater in emphysematous patients than in normal persons, on exercise the disparity becomes much greater. The greatly increased work involved in moderately raising respiratory flow may be the cause of the dyspnoea which accompanies even mild exertion. The subjective sensation of hard-working respiratory muscles spells "breathlessness" to the patient, even though there may be only slight increase in effective ventilation and no disturbance of oxygen or carbon dioxide content of the arterial blood. In addition, tests have shown that these patients are incapable of performing the same amount of respiratory work as a normal person, possibly

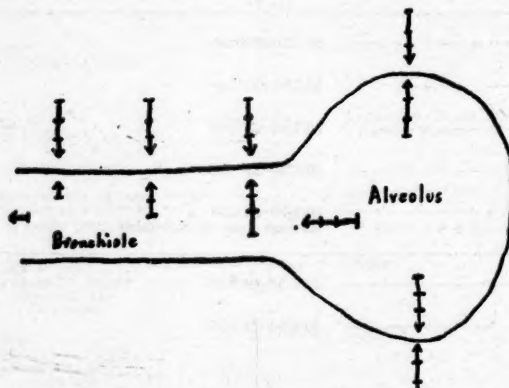


FIGURE II.

Diagram of pressures exerted on the walls of an alveolus and a bronchiole with narrowed lumen in an emphysematous subject during expiration (see description in text). The length of the arrows represents the degree of pressure exerted at each point.

because their muscles are working in the position of almost full inspiration. This appears to place them at a mechanical disadvantage. In other words, the emphysematous subject is unable to do as much respiratory work as a normal person, and the work he does is less effective in producing air flow.

Impairment of Gas Exchange between Air and Blood.

In considering abnormalities of gas exchange, the important factors are the loss of elasticity of the lung and the destruction of alveolar walls with the formation of large air sacs. In health fairly uniform ventilation of the lung is the rule, but as a result of the foregoing changes unequal expansion of different parts occurs, so that some alveoli are over-ventilated while others achieve little air exchange. Some air sacs are well ventilated, but owing to a diminished capillary network in their walls not much air-blood gas exchange can take place. In other alveoli in which the blood supply is normal there is practically no replacement of air, so that as its oxygen content diminishes and the carbon dioxide content rises, the tensions of these two gases approach equilibrium with those of the venous blood entering the capillaries. Thus the blood traverses the walls of these alveoli and leaves them with its oxygen

and carbon dioxide contents practically unchanged. Even increased ventilation of the remaining normal alveoli cannot counterbalance this veno-arterial shunt, which is the basic cause of anoxemia and hypercapnia in emphysema. Tests can be made of the over-all efficiency of intrapulmonary mixing of gases, and the results of these can be correlated with the severity of the disease.

In the severe cases in which carbon dioxide retention occurs at rest or on exercise, the respiratory centre appears to become insensitive to this gas and the patient breathes quietly with a blood carbon dioxide level which would cause hyperventilation in the normal person. In the same way, the breathing of high concentrations of carbon dioxide fails to elicit the usual hyperpnea in these subjects (Donald and Christie, 1949). This means that the stimulus to respiration can be coming only from the effect of lowered oxygen concentration on the chemoreceptors in the aortic and carotid bodies. If the patient breathes oxygen in high concentration this stimulus is removed, ventilation is reduced, carbon dioxide accumulates still further in the blood, and the subject lapses into coma and possibly death from its toxic effects. This complication has been reported by Donald (1949), by Comroe *et alii* (1950), and by others.

Therapy.

Baldwin *et alii* (1949) have divided patients with emphysema into three grades of increasing severity: (i) those who have dyspnoea on exertion, but no abnormal blood gas concentrations; (ii) those in whom exertion causes anoxia, but no increase of arterial carbon dioxide content; (iii) those in whom anoxia and carbon dioxide retention occur at rest or on exertion.

The treatment of patients in grades (i) and (ii) consists chiefly in the administration of bronchodilators to improve the mechanical efficiency of breathing. It has been shown by many investigators that an injection of adrenaline will temporarily increase the vital capacity and the maximal breathing capacity of these patients. Ephedrine, 0.5 grain, or "Neo-Ephedrine", 20 milligrammes given sublingually three times a day, will usually produce the same effect, or bronchodilator nebulizers may be used as recommended by American authors (Baldwin *et alii*, 1949). Breathing exercises may be helpful in educating the patient to make the best use of his defective respiratory equipment. Measures to raise the diaphragm during expiration and so improve its action include the application of tight abdominal binders, the induction of pneumoperitoneum, or lying in the head-down position at about 16° inclination so that the weight of the abdominal contents bears headwards. None of these devices seem to have proved their practical value.

Mechanical respiration by means of the iron lung (Boutourline-Young and Whittenberger, 1951), and intermittent posture pressure breathing (Smart *et alii*, 1952) have been tried with some success as a means of eliminating excess carbon dioxide from the blood in patients with carbon dioxide retention. "Diamox" has also been used in an endeavour to lower the plasma bicarbonate content and so cause the "blowing off" of equivalent amounts of carbon dioxide (Nadell, 1953). Fishman and his associates (1955) have claimed some success from this form of therapy. However, it must be emphasized that the use of "Diamox" can help only patients who have a raised carbon dioxide level in the arterial blood, and that this can be determined only by special investigation in a suitably equipped laboratory. It is not a method of treatment to be used indiscriminately.

Recent investigators (Tenney and Miller, 1955) have suggested that salicylate acts as a direct respiratory stimulant, and that it may be of value in the treatment of this condition. Further study will be necessary before the full import of this is clear.

Of more certain value is prompt control of respiratory tract infections with antibiotics in patients with emphysema, because it is usually an acute exacerbation of bronchitis which brings about a cardio-pulmonary crisis (so-called acute cor pulmonale). Lastly, if oxygen is necessary it should be given at a slow rate—for example, one or two litres per minute—or intermittently—for example, six to

eight litres per minute for one-quarter of an hour, none for the next quarter, on again for the succeeding quarter, and so on. In this way the dangers of excessive carbon dioxide retention in the blood can be avoided.

Summary.

A brief sketch is given of the disordered physiology in emphysema. Current methods of treatment are mentioned.

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Reports of Cases.

DOUBLE INFECTION WITH TWO SEROTYPES OF LEPTOSPIRÆ: A CASE REPORT.

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PUBLISHED clinical studies of leptospirosis include no definite instance (as far as the writers are aware) of a patient infected with two serotypes of leptospiroæ at the same time. Agglutinins are commonly developed against more than one serotype, but this cross-agglutination usually follows a pattern predictable from the antigenic characteristics of the infecting strain (Wolf, 1953). Repeat infections with anamnestic responses may also occur. An occasional patient in North Queensland, with no history of previous infection, is found to develop agglutinins against serotypes that are not antigenically related, and that do not usually show cross-agglutination. These suggest the possibility of double infection, especially as 13 serotypes cause leptospirosis in the area (Smith *et alii*, 1954; Smith and Brown, 1955); but the suggestion is difficult to prove.

The investigation of the present patient provides circumstantial evidence that she was infected simultaneously with the *hyos* and "Szwajizak" serotypes.

Clinical Record.

A., aged thirty-eight years, a housewife, of Babinda, was admitted to the Babinda District Hospital on November 1,

1954. She complained of headache, vomiting, and malaise of two days' duration; she had no urinary or respiratory symptoms. Her temperature was 102.6° F.; she had small palpable glands in both axillae; her liver edge was palpable and tender one-half inch below her right costal margin. Her eyes were not injected, and her neck was not stiff. She was considered to have leptospirosis, and was treated with penicillin, 500,000 units every three hours. Her temperature fell quickly to normal, and she was discharged from hospital on November 6.

She was readmitted to hospital on November 15, complaining of feverishness and headache. Her temperature was 99.4° F., small axillary glands were still palpable, and tenderness was present in the epigastrium. She was afebrile on November 16. However, leptospirae were found on that day in cultures which had been made from blood taken during her first illness, and her symptoms were still present, so her doctor commenced a second course of penicillin. Her temperature rose to 103.6° F. next morning, was normal on November 21 and 22, but rose again from November 23 to 26. She developed a macular rash on her trunk on November 25; it did not itch, and disappeared in forty-eight hours. The patient was afebrile on November 27 and left hospital at her own request. Her clinical course is shown in Figure I.

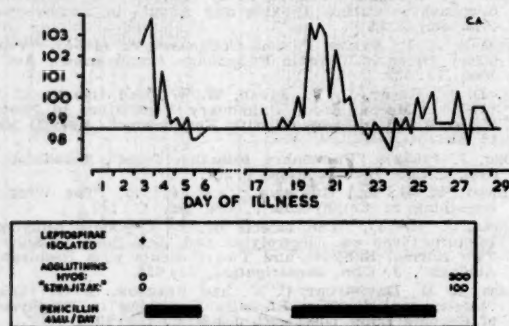


FIGURE I.
Temperature chart of Patient A.

Laboratory Investigations.

Tubes of Schüffner's and Fletcher's media were inoculated with blood taken on the patient's admission to hospital and were found to contain leptospirae on November 16. Subcultures were forwarded to Brisbane for typing, where further subcultures were made. One of these next subcultures, when tested against type antisera, was agglutinated by *hyos* antiserum to full titre. The strain was maintained by regular subculture, and at the eleventh subculture gave no reaction against *hyos*, but was agglutinated by "Szwajizak" antiserum to full titre (Table I).

Hyperimmune antiserum was prepared against the fourteenth subculture by inoculation into a rabbit, in accordance with the technique described previously (Smith *et alii*, 1954). This antiserum gave reactions typical of the "Szwajizak" serotype, and did not agglutinate *hyos* (Table II).

Serum was taken from the patient on the third and twenty-seventh days after the onset. The agglutination tests showed a serological response against both the *hyos* and "Szwajizak" serotypes (Table III). The antibodies against these serotypes were removed independently of each other by absorption of the serum with *hyos* and a late subculture of the patient's own strain (Table IV).

Mice were inoculated with blood taken from the patient on her admission to hospital (two mice receiving an intraperitoneal inoculation of one millilitre of clot suspended in physiological saline). The first-passage mice remained well, and one showed no abnormality when killed for passage at nine days. The survivor was killed one month after inoculation, and many leptospirae were seen on direct dark-ground examination of a kidney smear. The second-passage mice did not become urinary carriers; both were killed sixty-three days after inoculation, and serum was

taken for agglutination tests. Each mouse had agglutinins against both *hyos* and "Szwajizak" (Table V).

Early subcultures, inoculated in November, 1954, still contained motile leptospirae in April, 1955. Four of these,

TABLE I.
Agglutination-Lysis Reactions of Culture Isolated from Patient A.

Type Antisera.	Sero-Reactions. ¹	
	Second Subculture.	Eleventh Subculture.
<i>icterohemorrhagica</i> ..	0	0
<i>canicola</i> ..	0	0
<i>australis B</i> ..	0	0
"Robinson" ..	0	0
<i>australis A</i> ..	0	0
"Esposito" ..	0	0
<i>potomica</i> ..	0	0
<i>medanensis</i> ..	0	3
"Kremastor" ..	0	10
"Szwajizak" ..	0	100
<i>hyos</i> ..	100	0
"Celledoni" ..	0	0
<i>grippotyphosa</i> ..	0	0

¹ Titres expressed in percentages of reciprocal for the homologous strain; "0" signifies less than 0.3%.

and further subcultures made from them, reacted to full titre against "Szwajizak" antiserum, but gave no reaction with *hyos* antiserum.

TABLE II.
Agglutination-Lysis Reactions of Hyperimmune Rabbit Antiserum Prepared Against Fourteenth Subculture.

Type Strain.	Sero-Reaction. ¹
<i>icterohemorrhagica</i> ..	0
<i>canicola</i> ..	0
<i>australis B</i> ..	0
"Robinson" ..	0
<i>australis A</i> ..	0
"Esposito" ..	0
<i>potomica</i> ..	0-1
<i>medanensis</i> ..	3
"Kremastor" ..	100
"Szwajizak" ..	0
<i>hyos</i> ..	0
"Celledoni" ..	0
<i>grippotyphosa</i> ..	0

¹ Titres expressed in percentages of reciprocal for the homologous strain; "0" signifies less than 0.1%.

Discussion.

The patient's primary illness was typical of leptospirosis. The second illness resembled dengue, in its biphasic temperature chart and the rash, and it is known that the patient visited Innisfail (where cases of dengue were occurring) during the interval. Her serum did not react with an antigen prepared from Murray Valley encephalitis virus. This often gives a strong complement fixation reaction with the serum of patients infected with dengue, but its failure to do so in this case does not exclude the diagnosis of dengue. On the other hand, the rise in temperature on November 17 after renewal of therapy suggests that the fever could have been a reaction to the antibiotic. Its relation to the primary illness is obscure in either case.

It has been shown that the infecting agent (or agents) in this case produced antibody responses against both *hyos* and "Szwajizak" in the patient and in inoculated mice. An early subculture reacted with *hyos* antiserum, but by the eleventh subculture the serological reactions were typical of "Szwajizak".

These results can be explained on the hypothesis that the patient had a double infection, and that *hyos*, the dominant serotype in the early subcultures, was overgrown

by "Szwajzak" later. The alternative would be to suggest that the original reaction with *hyos* antiserum was due to a laboratory error (which is considered unlikely, but cannot be summarily rejected), and that the double antibody response was due to anamnestic reaction or cross-

TABLE III.
Agglutination-Lysis Reactions of Paired Sera from Patient A.

Type Strain.	Reactions of Patient's Serum. ¹	
	Third Day.	Twenty-seventh Day.
<i>icterohemorrhagica</i> ..	0	0
<i>canicola</i> ..	0	0
<i>australis B</i> ..	0	0
"Robinson" ..	0	0
<i>australis A</i> ..	0	0
"Exposito" ..	0	0
<i>pomona</i> ..	0	0
<i>medanensis</i> ..	0	0
"Kremastor" ..	0	30
"Szwajzak" ..	0	100
<i>hyos</i> ..	0	300
"Celledoni" ..	0	0
<i>grippotyphosa</i> ..	0	0

¹ Titres expressed as reciprocal of agglutination-lysis titre.

agglutination. Anamnestic response could perhaps have occurred in the patient, but not in the mice. Cross-agglutination also seems unlikely; *hyos* and the *hebdo-*

TABLE IV.
Absorption Tests with the Serum Taken from Patient A on the Twenty-seventh Day.

Serum Absorbed by Strain.	Titre against Strain. ¹		
	<i>hyos</i> .	Patient A. (Late Subculture).	"Kremastor."
<i>hyos</i> ..	300	300	30
Patient A (late subculture) ..	0	100	0
	300	0	0

¹ Titres expressed as reciprocal of agglutination-lysis titre.

madis group (of which "Szwajzak" is a member) are antigenically distinct (Wolff, 1953; Smith *et alii*, 1954), and it appears to be excluded by the results of the absorp-

TABLE V.
Agglutination-Lysis Reactions of Sera from Mice Sixty-three Days after Inoculation.

Type Strain.	Sero-Reactions. ¹	
	Mouse 1.	Mouse 2.
<i>icterohemorrhagica</i> ..	0	0
<i>canicola</i> ..	0	0
<i>australis B</i> ..	0	0
"Robinson" ..	0	0
<i>australis A</i> ..	0	0
"Exposito" ..	0	0
<i>pomona</i> ..	0	0
<i>medanensis</i> ..	0	0
"Kremastor" ..	0	30
"Szwajzak" ..	100	300
<i>hyos</i> ..	100	300
"Celledoni" ..	0	0
<i>grippotyphosa</i> ..	0	0

¹ Titres expressed as reciprocal of agglutination-lysis titre.

tion tests. The possibility that the infecting strain had an atypical relation to both *hyos* and "Szwajzak" is discounted by the sero-reactions of the later subcultures, and of the hyperimmune rabbit antiserum.

Summary.

A patient with leptospirosis developed agglutinins against the *hyos* and "Szwajzak" serotypes. The strain isolated by blood culture reacted with *hyos* antiserum in an early subculture, but showed the typical reactions of the "Szwajzak" serotype in later subcultures. It is suggested that she had a double infection.

Acknowledgements.

The writers are indebted to Dr. J. Connolly, who treated the patient in her first illness, to Dr. R. Percy, who treated her in the second illness, and to Miss M. L. Emanuel, of the Queensland Institute of Medical Research, who isolated the culture of leptospiræ and performed the mouse inoculations.

Addendum.

Since this paper was submitted for publication we have noted a report by Wiesmann and Suter (1956) of a labourer in a piggery who became simultaneously infected with *L. pomona* and *L. hyos*.

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"Q" FEVER: REPORT OF THREE CASES.

By W. F. HUNTER AND J. M. DUGGAN,
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RECENTLY three patients were admitted to the Royal Newcastle Hospital with pyrexial illnesses which were finally diagnosed as "Q" fever. So far as we are able to discover, no previous cases have been reported in this area or in any district as far south as this in eastern Australia. All three were young male abattoir workers, admitted to hospital within a space of three weeks, in whom there appeared to be a common, distinct clinical pattern. All three made uneventful recoveries and have since remained well.

Case 1.

A, aged twenty-six years, was admitted to hospital on March 8, 1955, with a history of generalized aches and pains of five days' duration, followed by fever, headache and prostration. Shortly afterwards a cough with a little purulent sputum developed. He was a cattle slaughterman with no history of significant previous illnesses. On examination of the patient he was found to be sweating freely; his temperature was 101.6° F. and his pulse rate was 68 per minute. The urine contained bile pigments, and there was tenderness in the right hypochondrium.

Next morning the temperature fell to normal and rose again that evening to 101° F.; it was noted that air entry was poor at the base of the right lung and that the spleen was palpable two fingers' breadth below the left costal margin. Next morning the temperature fell to normal and remained down without specific therapy.

A number of investigations were carried out. On March 8 an X-ray examination of the chest revealed no abnormality. On March 10 the white blood cells numbered 7100 per cubic millimetre, 45% being neutrophile cells, 31% lymphocytes, 22% monocytes and 2% eosinophile cells. On

March 14 the white blood cells numbered 8800 per cubic millimetre, 43% being lymphocytes, 42% neutrophile cells, 13% monocytes, 1% eosinophile cells and 1% immature cells. Agglutination tests for typhoid and paratyphoid fever, typhus, scrub typhus and brucellosis gave negative results. The results of serological investigation for rickettsial infection are shown in Table I.

Case II.

The patient, B., a male, aged twenty years, was admitted to hospital on March 21, 1955, complaining of pain in the right hypochondrium extending to the right side of the chest, which had begun ten days before his admission, with associated severe sweating and anorexia. Severe headache, worse when he was sitting up, had been present for three days, and cough for two days prior to his admission to hospital. No relevant previous history was noted. On examination the patient was in a good state of nutrition, rather flushed; his temperature was 103.2° F., his pulse rate 100 per minute, and his respiratory rate 28 per minute. Slight neck rigidity was present, but no other abnormal physical findings were noted; there was no rash and the patient was not jaundiced. Examination of the urine showed that it contained "one-fifth" albumin, and bile pigments were present. During the patient's stay in hospital the pyrexia was of a remittent character, the temperature rising to 104° F. on the first and second days; the patient had a rigor on the second day, and then the temperature fell, with no specific therapy, to remain normal from the fifth day onwards.

This patient had worked in the slaughter yards as an "odd job man", for the most part hanging sheep skins, for a period of one week, and the interval between his leaving the abattoirs and the onset of symptoms was approximately seventeen days.

Laboratory investigations were as follows. On March 22 and 23 blood taken for culture was found to be sterile.

A full blood count gave the following information: the red blood cells numbered 5,300,000 per cubic millimetre and the haemoglobin value was 16.7 grammes *per centum*; the white blood cells numbered 3250 per cubic millimetre, 63% being neutrophile cells, 34% small lymphocytes, and 3% eosinophile cells. No malarial parasites were seen in the blood film. Attempted culture of the urine produced no growth of organisms in forty-eight hours. Agglutination tests on March 23 gave negative results for typhoid and paratyphoid fevers. On March 25 the serum bilirubin content was 0.6 unit. Attempted culture of the faeces on March 24 produced no growth of pathogens. An X-ray examination of the chest on March 23 was normal. The results of the serological investigations for rickettsiae are seen in Table I.

Case III.

C., aged seventeen years, a labourer, was admitted to hospital on March 28, 1955, with a history of headache of four days' duration, followed by unproductive cough and joint pains for three days and anorexia for two days. He had had no relevant past illnesses. On examination of the patient, the temperature was 101° F. and pulse rate 104 per minute. Tenderness was present in the right hypochondrium and the tip of the spleen was palpable. There were no other abnormal findings. On these findings "Q" fever was suspected. The next morning signs of meningeal irritation were noted and lumbar puncture was performed. The same day sulphonamide therapy was begun, but the irregular rise of temperature to 104° F. with a relative bradycardia persisted, so that on March 31 treatment with chloramphenicol, 500 milligrammes every six hours, was commenced, and four days later, on April 3, the temperature appeared to be responding and antibiotics were suspended. Over the next five days the temperature slowly fell to normal, although on April 7 the spleen was still palpable below the left costal margin, there were enlarged glands in the axillae and inguinal regions, and doubtful enlargement of the liver was present.

A number of investigations were carried out. On March 31 an X-ray examination of the chest revealed no abnormality.

On March 30 a full blood count gave the following information: the haemoglobin value was 16.3 grammes *per centum*; the red cell count was 5,200,000 per cubic millimetre; the white cell count was 5850 per cubic millimetre, 81% being neutrophile cells, 14% lymphocytes, 4% monocytes and 1% eosinophile cells. On April 5 the white cell count was 5800 per cubic millimetre, 58% being neutrophile cells, 29% lymphocytes, 10% monocytes and 3% eosinophile cells. On March 29 examination of the cerebrospinal fluid revealed no cells. The protein content was 30 milligrammes per 100 millilitres and the chloride content was 680 milligrammes per 100 millilitres. Examination of the urine on two occasions gave normal results. Agglutination tests for typhoid and paratyphoid fever gave negative results. The results of investigation for rickettsial infection are seen in Table I.

TABLE I.
Serological Investigations.

Case Number: Date of Examination.	Agglutination Reciprocal of Titre.	Complement Fixation Reciprocal of Titre.
I. Serum 11.3.55	—	16
Serum 5.4.55	16	128
II. Serum 22.3.55	—	8
Serum 12.4.55	128	64
III. Serum 29.3.55	—	—
Serum 26.4.55	64	128

Discussion.

On serological and clinical grounds it seems reasonably certain that these patients suffered from "Q" fever.

The clinical pattern of an acute onset of headache, generalized aches and pains and fever with a relatively slow pulse rate was noted by Derrick in his original description in 1937. However, two of the three patients also had splenomegaly, and all had pain or tenderness in the right hypochondrium. Splenomegaly was not a feature in the cases reported by Derrick (1937) or by Harman (1949). All the patients had a cough, with or without sputum, but in no case were radiologically evident lesions found in the lungs, although changes were noted on X-ray examination in some of the cases of Harman (1949) and of Caughey and Dudgeon (1947). None of these patients had been out of the district prior to the illness, and they were not associated with one another at their work. It may well be that this disease is not so rare in areas south of Queensland as the paucity of case reports would indicate. Evidence in favour of this was obtained when two other patients upon investigation were found to have serological evidence of past infection with "Q" fever.

Summary.

The clinical histories of three patients suffering from "Q" fever are presented.

In patients presenting the clinical picture outlined, particularly in those associated with cattle, the disease should be suspected even in these latitudes.

Acknowledgements.

We are particularly indebted to the Laboratory of Microbiology and Pathology, Brisbane, for the serological investigations for *Coxiella burnetii* in these cases. We are also grateful to the honorary medical officers, under whose care these patients were admitted to hospital, for permission to publish these cases.

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Reviews.

Psychosomatics. By Max Hamilton, M.D., D.P.M., with a foreword by Professor D. R. MacCalman, M.D., F.R.C.P.E. Frontiers of Science Series. General Editor, Bernard Lovell, O.B.E., Ph.D., F.Inst.P. 1955. London: Chapman and Hall, Limited. 7½" x 5½", pp. 238, with many illustrations. Price: 21s.

THIS small book is one of the "Frontiers of Science Series" in which the intention is to illuminate areas of scientific advance in language comprehensible to those who are not specialists in the field. The author critically reviews experiments in "psychosomatics", highlighting those which stand up to statistical examination. In a preliminary survey of the mind-body relationship he shows how medicine has created an artificial dichotomy. He himself remains true to the basic biological Darwinian approach, though fully prepared to examine other concepts of behaviour which may throw light on psychosomatic problems. Although expressing the viewpoints of various authorities, he himself refrains from a definition of psychosomatics, though he is obviously confining his treatise to those disorders which are known to be connected with autonomic dysfunction. He illustrates theory in clear terms, demonstrates the value of this approach to medicine in general, and indicates that its importance will be in terms of practical application rather than premature classification. The main part of the book is concerned with a consideration of psychosomatic disorders as related to body systems—respiratory, gastrointestinal, cardio-vascular, skin and endocrines—with metabolic and rheumatic syndromes in addition. One important lack is the consideration of emotional factors in epilepsy. There is also insufficient consideration of recent work on cerebral structure and function in relation to emotional responses. The concluding chapter frankly recognizes the limitations of personality studies, and of the deeper psychodynamic approach, since psychology has not yet developed an adequate theory of human personality. Psychosomatic mechanisms similarly are difficult to elucidate because of the extraordinary complexity of the body reactions involved. The author does recognize the need to consider genetic and social factors. He points out the exploratory nature of this field of scientific advance and mentions how the increasing mass of neuro-endocrine data relating to physical and psychological stress, not available till recently, has enabled Selye to formulate some hypotheses for testing. Some 260 references and 340 authorities are listed, and the general index is adequate. This book can be recommended to those who wish to obtain a brief perspective of this field and a guide to further study.

James Parkinson, 1755-1824: A Bicentenary Volume of Papers Dealing with Parkinson's Disease, including the Original "Essay on the Shaking Palsy". Edited by Macdonald Critchley, with the collaboration of William H. McMenemey, Francis M. R. Walshe and J. Godwin Greenfield; 1955. London: Macmillan and Company, Limited. 7" x 5", pp. 284. Price: 15s.

IN every age and every clime, to be a radical is a crime. And so, one of the most remarkable of general practitioners of medicine that the world has ever known was denied the honour of a centenary celebration to mark the date of his birth. More than that, he was not thought worthy of a painted likeness of himself, a memorial tablet, a published biography, or even a rugged headstone in the graveyard of his parish church of Saint Leonard's at Shoreditch, where it is known that his mortal remains were interred. However, the medical profession in many countries recently celebrated the bicentenary of James Parkinson's birth, acclaiming him as an enlightened scholar, writer, doctor and scientist; although he is more likely to retain his place among the immortals as a social reformer and militant humanitarian with a vision far beyond his age.

A unique tribute to the memory of James Parkinson has appeared in the form of a symposium edited by Dr. Macdonald Critchley, who has happily combined an excellent biographical sketch written by Dr. William H. McMenemey, a reproduction of Parkinson's original essay on the shaking palsy which first appeared in 1817, a learned disquisition by

Dr. J. G. Greenfield on the known pathology of *paralysis agitans*, and, finally, a critical analysis of its clinical features from the experience of an eminent London physician, Sir Francis Walshe. In fact, the medical historian could wish for no more complete and satisfying commentary on the life and work of an original genius than that so ably presented in this small bicentenary volume.

In 1784 Parkinson obtained his diploma from the Company of Surgeons in London and succeeded to the practice of his father in the Surrey village of Hoxton; and then, to extend his knowledge, he thought it worth while to attend the regular course of lectures given by John Hunter, which he took down verbatim in a shorthand script of his own. He transcribed these notes in full, and many years later they were published by his son as a rare addition to the valuable collection of Hunterian documents. The wide excursions of a busy general practice brought him in close contact with the lives of ordinary people, and like many intellectuals of the period, he soon found himself in sympathy with a movement courageously demanding the restitution of human rights. But these revolutionary activities eventually led to his appearance before the Privy Council, and he showed discretion by deciding henceforward to turn his thoughts to more innocuous exercises.

At a time when the modern sciences were still in an embryonic stage, Parkinson made a systematic study of, and then published a book on, inorganic chemistry, which was a prelude to his thorough researches in the practically unexplored field of paleontology. A famous geologist of the last century described his book "Organic Remains of a Former World" as "a memorable event in the history of British paleontology". In 1812 he and his son, John, were jointly responsible for the first mention of appendicitis in British medical literature, when they published the case report of a boy who had died from general peritonitis due to the perforation of an inflamed appendix. Ten years later, Parkinson was the first recipient of that most exclusive of all awards—the Gold Medal of the Royal College of Surgeons in London—"in consideration of his useful labours for the promotion of Natural Knowledge".

This is a book to be read by all members of the profession for its moving narrative of noble enterprise and high adventure.

Diagnosis and Treatment of Vascular Disorders: Angiology. Edited by Saul S. Samuels, A.M., M.D., F.A.C.A., F.A.C.C.; 1956. Baltimore: The Williams and Wilkins Company. Sydney: Angus and Robertson, Limited. 10" x 7", pp. 628, with many illustrations. Price: £8 16s.

THIS is a pretentious book and sets out to be a complete presentation of the specialty which the editor, Dr. Samuels, has called angiology. It is complementary to the journal of that name which he founded and edits. It may be said at once that it covers a wide field in great detail, is beautifully produced and illustrated and can be recommended (with some reservations) as a reference book of current knowledge in the field.

It is doubtful whether the claim of angiology to be a complete specialty can be maintained. The blood vessels are too intimately associated with the organs and tissues in which they run for their study to be divorced from the general field of internal medicine. The arrangement and subject matter of this book confirm this. By all means let the angiologists devote chapters to atherosclerosis, *diabetes mellitus*, *polyarteritis nodosa* and so on; but indeed these diseases with their "multisystem" symptomatology must surely represent one of the major sign posts pointing the dangers of ultra-specialization.

It is, of course, in the field of vascular surgery that new techniques are requiring the detailed training that leads to the more circumscribed specialty. Is there, however, good reason for separating peripheral vascular surgery from cardio-vascular surgery in general? The physician *cum* surgeon envisaged by the editor, who is capable of handling both fields, seems unlikely to evolve and unnecessary. Teamwork is just as necessary in dealing with these clinical problems as it was in compiling this book.

Anatomy and physiology, and in particular the role of the autonomic nervous system, are fully dealt with, aetiology and pathogenesis are discussed at length, but with the inevitable lack of conclusions. The minor surgical procedures are described in detail and the chapter on angiography is excellent.

A chapter on *endarteritis obliterans* offers an interesting solution to the clinical paradox of severe peripheral ischaemic disease, despite normal peripheral pulses. The editor writes the chapter on *thrombo-angitis obliterans*. On four occasions through the text he discusses at length his theory that the condition is due to fungous infection of the vessels. He bases this firstly on the findings of one investigator that mycotic infections of the feet were more common in sufferers from *thrombo-angitis obliterans*, and secondly on the impression that there has been a decrease in incidence of the disease since World War II, probably owing to increased use of fungicides by the armed forces. So convincing does he find this evidence that he concludes: "If and when an antibiotic fungicide is discovered that can be administered orally or parenterally the complete solution of treatment of this and many other diseases will be at hand." Is this really a critical approach?

Peripheral vascular disease has, traditionally, been a field of high-flown theories based on slight evidence. This book is not entirely free from the trend. The reader must, as always, decide for himself.

Modern Nutrition in Health and Disease: Dietotherapy. Edited by Michael G. Wohl, M.D., and Robert S. Goodhart, M.D., with 55 contributions; 1955. Philadelphia: Lea and Febiger. Sydney: Angus and Robertson, Limited. 9" x 6½", pp. 1062, with 210 illustrations. Price: £10 3s. 6d.

THIS book is a successor to Wohl's "Dietotherapy", and according to the authors 80% of the text consists of new material. It follows the pattern of many books today in that the editors have induced some 53 other writers to contribute chapters or sections in addition to the several sections written by themselves. By the careful selection of contributors the reader is ensured of obtaining the most authoritative statement on every subject, a task which may prove impossible for a single author. This procedure does, however, lead to overlapping, and it undoubtedly contributes substantially to the length of the book, 1060 pages of text, which contain a lot of words on diet and nutrition, even with the advances of the last decade.

The book is divided into three parts. Part I deals with normal nutrition and this is the best section. Many of the thirty sections are precise and cover the essential facts. A number of subjects which are new in this edition are not usually found in text-books on nutrition. There are two informative and useful chapters on appetite and hunger, and another on dietary interrelations which brings together a great deal of information that up to the present has been scattered through the research journals. The first part of the chapter on the hormonal control of metabolism, which is also new, is devoted to the metabolic role of vitamins with a good diagram of the metabolic process through which proteins, fats and carbohydrates pass; the diagram includes the Krebs cycle.

Part II is some 400 pages in length and is devoted to nutrition in disease. The nutritional implications and the appropriate dietotherapy are given for each disease. In some chapters too much space seems to be devoted to the medical, physiological, nutritional or pathological features of the disease; in not a few places this is a duplication of material in Part I. Some of the authors of the individual chapters seem to have erred in thinking they were writing a text-book of medicine. Part II could have been shortened by a grouping of the medical and surgical conditions which need the same type of dietary management. Some readers might consider a number of sections superfluous, for example, since "the cause of psoriasis is entirely unknown", it is not necessary to devote three pages to diets which might be used in its treatment. There are a number of similar examples.

Part III is concerned with nutrition in periods of physiological stress, and deals with nutrition in pregnancy, infancy and adolescence, the aged, work and emergencies. In the chapter on nutrition in pregnancy considerable space is devoted to fetal nutrition and the demands of the different trimesters. Relatively little space is given to toxæmia of pregnancy and its prevention by dietary means; there is a noticeable omission of Australian references. Nutrition in infancy is treated fully with consideration of the requirements, methods of providing them and the main problems of infants and older children.

This is a comprehensive book with probably too much detail for the student, but it should prove valuable to the physician who wishes to use diet therapy as well as the other forms of treatment in the management of his patients.

Books Received.

[The mention of a book in this column does not imply that no review will appear in a subsequent issue.]

"The Recovery Room: Immediate Postoperative Management", by Max S. Sadove, M.D., and James H. Cross, M.D., with contributions by 24 authorities; 1956. Philadelphia and London: W. B. Saunders Company. Melbourne: W. Ramsay (Surgical), Limited. 9½" x 6", pp. 618, with illustrations. Price: £6.

Based on experiences gained in front line hospitals in the second World War.

"Surgery for General Practice", by Victor Richards, M.D.; 1956. St. Louis: The C. V. Mosby Company. Melbourne: W. Ramsay (Surgical), Limited. 10" x 7", pp. 947, with illustrations. Price: £9 12s. 6d.

The author has had the assistance of seven associates.

"Diseases of the Skin", by Richard L. Sutton, junior, A.M., M.D., F.R.S. (Edin.); Eleventh Edition; 1956. St. Louis: The C. V. Mosby Company. Melbourne: W. Ramsay (Surgical), Limited. 10" x 7", pp. 1501, with 1972 illustrations. Price: £10 4s. 6d.

The tenth edition was reprinted with emendations in 1942 and 1943.

"Endogenous Uveitis", by Alan C. Woods, M.D.; 1956. Baltimore: The Williams and Wilkins Company. Sydney: Angus and Robertson, Limited. 10" x 7", pp. 319, with illustrations by Annette Smith Burgess. Price: £5 17s. 6d.

Intended for the student of ophthalmology "rather than for the edification of the already trained specialist".

"Modern Views on the Secretion of Urine: The Cushny Memorial Lectures", edited by F. R. Winton, M.A., M.D., D.Sc.; 1956. London: J. and A. Churchill, Limited. 8½" x 5½", pp. 300, with illustrations. Price: 30s.

These are ten lectures by different authors designed to commemorate the work of Professor A. R. Cushny.

"Children in Hospital: Paediatrics for the General Hospital Nurse" by Margaret M. Leach, S.R.N., R.S.C.N., with a foreword by Victoria Smallpeice, M.A., M.D., F.R.C.P.; 1956. London: Faber and Faber, Limited. 7½" x 5", pp. 160, with illustrations. Price: 9s. 6d.

Intended as a guide and preliminary help to those who, unused to children, find themselves working among them for the first time.

"Postural and Relaxation Training: In Physiotherapy and Physical Education", by John H. C. Colson, F.C.S.P., M.S.R.G., M.A.O.T.; foreword by J. M. P. Clark, M.B.E., M.B., Ch.B., F.R.C.S.; 1956. London: William Heinemann (Medical Books), Limited. 5" x 7½", pp. 115, with illustrations. Price: 12s. 6d.

A guide to the practical methods used today in the treatment of postural defects.

"Neurological Nursing: A Practical Guide", by John Marshall, M.D., M.R.C.P. (Edin.), D.P.M.; 1956. Oxford: Blackwell Scientific Publications. 9" x 6½", pp. 176, with illustrations. Price: 18s. 6d.

The book is entirely concerned with the practical problems encountered in the care of patients suffering from neurological disease.

"Ciba Foundation Colloquia on Ageing: Ageing in Transient Tissues", edited by G. B. W. Wolstenholme, O.B.E., M.A., M.B., B.Ch., and Elaine C. P. Millar, A.H.W.C., A.R.I.C.; Volume 11; 1956. London: J. and A. Churchill, Limited. 8½" x 5½", pp. 274, with 96 illustrations. Price: 36s.

Seventeen subjects were discussed at this colloquium.

"A Short History of Public Health", by C. Fraser Brockington, M.A., M.D., D.P.H., B.Chir. (Cantab.), M.Sc. (Manchester); 1956. London: J. and A. Churchill, Limited. 7½" x 5", pp. 243. Price: 15s.

Divided into two parts—the growth of public health and special aspects of that growth.

The Medical Journal of Australia

SATURDAY, OCTOBER 27, 1956.

All articles submitted for publication in this journal should be typed with double or treble spacing. Carbon copies should not be sent. Authors are requested to avoid the use of abbreviations and not to underline either words or phrases.

References to articles and books should be carefully checked. In a reference the following information should be given: surname of author, initials of author, year, full title of article, name of journal, volume, number of first page of the article. The abbreviations used for the titles of journals are those adopted by the Quarterly Cumulative Index Medicus. If a reference is made to an abstract of a paper, the name of the original journal, together with that of the journal in which the abstract has appeared, should be given with full date in each instance.

Authors who are not accustomed to preparing drawings or photographic prints for reproduction are invited to seek the advice of the Editor.

OCCUPATIONAL HEALTH IN AUSTRALIA.

WHEN Dr. Donald Hunter, Physician Director of the Department of Research in Industrial Medicine and Curator of the Museum, London, visited Australia in 1950 as the William McIlraith Guest Professor, he had certain discussions with the Council of The Royal Australasian College of Physicians. He pointed out that there were questions of principle relating to occupational health which were of importance to the Commonwealth of Australia. He thought that uniformity of legislation should be sought and that there should be a list of occupational hazards notifiable in every State of the Commonwealth. He recommended that a committee should be set up to consider problems relating to occupational diseases. Dr. Hunter enumerated points which he thought that a committee might consider. The Council of the College referred to a subcommittee some views set out by Dr. Hunter, and this subcommittee made the following observations and recommendations:

1. There is a definite need in Australia for the preparation of a comprehensive review of the present position regarding diseases of occupational origin.
2. The publication of an authoritative statement by a competent body on possible improvements in the present position of diseases of occupational origin would be an important contribution to the national health.
3. Should the Council of The Royal Australasian College of Physicians consider that this is a task which the College should undertake it is recommended:
 - (a) That a Committee on Occupational Health should be appointed by the Council of The Royal Australasian College of Physicians.
 - (b) That this Committee be appointed on the recommendations of a nominating committee and consist of those most suited to investigate occupational health and the associated problems,

whether or not they be Fellows or Members of the College.

- (c) That such a Committee should be given power to coopt and to delegate sections of its work to other committees, departments or persons.

The subcommittee recommended the appointment of a committee to investigate the subject and drafted terms of reference. The Council adopted the recommendation of the subcommittee and accepted the following terms of reference:

To consider the subject of Occupational Health in Australia, including its place in medical practice and its teaching, investigational and legislative aspects, and to make recommendations for its development.

The following committee was appointed: *New South Wales*: Dr. S. A. Smith (Chairman), Professor E. Ford (Dean of the Faculty of Medicine), Dr. H. Maynard Rennie (Honorary Secretary), Dr. Gordon Smith (Assistant Honorary Secretary), Dr. W. E. George, Dr. W. T. Nelson (died 1954), Dr. Cyril Cummins. *Victoria*: Dr. Ian J. Wood, Dr. D. O. Shiels, Dr. Keith Bowden. *South Australia*: Dr. A. R. Southwood. *Western Australia*: Dr. L. Hensell, Dr. W. S. Davidson, Dr. G. W. Pottinger. *Queensland*: Dr. O. S. Hirschfeld, Dr. D. Gordon. *Tasmania*: Dr. J. L. Grove. The coopted members were Dr. G. H. McQueen, of South Australia, and Dr. H. M. L. Murray, of Tasmania. The committee has made its report and the report has been published in roneo form.

The committee sought a definition of occupational health. The definition quoted is by Forssman published in the *British Journal of Industrial Medicine*. It is as follows: "The promotion and maintenance of the highest degree of physical, mental and social well being of workers in all occupations; the prevention amongst workers of diseases caused by their working conditions; the protection of workers in their employment from risks to health; the placing and maintenance of the worker in an occupational environment adapted to his physiological and psychological equipment, and, to summarize: the adaptation of work to man, and of each man to his job." Eight lines of inquiry were decided on as follows: Teaching, hospital and clinical practice, research, private practice, departmental practice, legislation, compensation and rehabilitation of disabled workers, prevention of hazards in industry. At the present time probably most interest will attach to the conditions existing for the teaching of undergraduate and post-graduate students in occupational health. The inquiries into undergraduate teaching were very searching. Questions were asked about the number of lectures given in occupational health and about the stage during the student course at which the lectures were given. The question was asked whether emphasis was put on one or more aspects of the study. Information was sought on the choice of lecturer and whether any specific clinical or hospital instruction in occupational disease was given. The question was also asked whether the students paid any visits to industries for teaching purposes, and finally whether specific questions in occupational health were asked in the examination of students. The final conclusion is rather devastating, for we read that in only New South Wales and Queensland is there any real attempt made to provide some degree of instruction in occupational health for medical students and only in New South Wales is there any significant

amount of post-graduate instruction. In New South Wales at least six and sometimes seven lectures on occupational health are given as part of the course in public health and preventive medicine. The main purpose of these lectures is to make the student aware of the definition, scope and present-day trends and objectives of industrial health. Attention is paid to the historical and international aspects of the subject and to developments in Australia. We read, however, that there is no clinical teaching in the occupational health portion of the public health and preventive medicine course, nor are hospital facilities available to the staff. Unfortunately very few industrial establishments are open on Saturday mornings, and this makes it impossible for classes of students to visit the industries. In place of these visits photographic slides and cinematograph films are used. It is intended that in the near future arrangements shall be made for a small number of selected students to spend a period of several days in the medical departments of large industries. In Queensland eleven lectures on occupational health are given, and films are shown to students in the fourth year. These lectures are part of the course on social and tropical medicine. Students are taken in groups of about ten to spend a day in a large industry with a great variety of processes and potential hazards, and the clinical problems arising from the latter are discussed. The provision made for the teaching of students in Victoria and South Australia is negligible, and, of course, Western Australia and Tasmania have at the present time no students to teach.

The information given on the post-graduate teaching of occupational health in New South Wales is interesting. There is no course leading to a diploma in the subject, but in recent years the instruction in the course for the diploma in public health has been increased appreciably, and now twenty-five lectures are given including some lecture-demonstrations and visits to about fifteen different industries. There is no clinical instruction. In conjunction with the Post-Graduate Committee in Medicine in the University of Sydney, a short course in occupational health of approximately one week's duration is held periodically. A course of this kind is open to all medical practitioners. Also under the auspices of the Post-Graduate Committee in Medicine two or three lectures on industrial pulmonary diseases are given every year during the course on diagnostic radiology. It is to be noted that a section of occupational medicine has been set up within the New South Wales Branch of the British Medical Association.

Under the heading of "Recommendations" the subject of teaching is discussed. First of all we read that the curriculum in any medical school should provide a course in public health and preventive medicine. This course should include at least six lectures in occupational health and some factory visits. In the opinion of the committee the lecturer responsible for instruction in occupational health should have access, preferably by virtue of an honorary appointment, to at least one teaching hospital in the State. It should be possible for him to be used in a consultative capacity in suspected or actual cases of occupational disease. It is thought that some of the patients seen in this way might be made available for teaching purposes. The further suggestion is made that the lecturer on occupa-

tional health should have an official association on a consultant basis with a factory medical clinic and a close association with the State Industrial Hygiene Division. In regard to post-graduate education in occupational health the committee discusses one State only—Victoria. The recommendation is made that increased post-graduate instruction should be provided in Victoria by the University of Melbourne and other interested bodies. It is also stated that as a first step in the development of post-graduate instruction in Victoria and the other States occasional short courses in occupational health should be arranged by the appropriate post-graduate organization. The opinion is expressed that when a diploma of public health is given in the absence of a diploma of industrial health given by the same body, the curriculum for the diploma in public health should have alternate choice of subjects and routes to the diploma. One route should allow the candidate to take the diploma specializing in occupational health.

Information on hospital and clinical practice was sought. The committee made a direct approach to some eighteen hospitals in the Commonwealth. Apparently only two hospitals in New South Wales were regarded as satisfactory. At Wollongong Base Hospital various tests for pulmonary function are being conducted on coalworkers, and investigations are being made of ex-coalworkers suffering from respiratory diseases. This clinic also provides various methods of treatment including physiotherapy and various types of inhalation therapy in order to ascertain their value in the treatment of certain types of respiratory diseases. In Victoria beds are now available at the Infectious Diseases Hospital at Fairfield for patients suffering from occupational disease, and similar arrangements have been made at the Prince Henry Hospital, Sydney, at Wollongong Base Hospital and at the Brisbane General Hospital.

In regard to private practice, although no detailed or comprehensive inquiry was made into private industrial medical services, sufficient evidence was available from all States to indicate that "having regard to the large number of persons employed in factories, the provisions existing for medical supervision by the majority of private firms are quite inadequate". The number of industries in the several States known to employ full-time or part-time medical officers are set out. In New South Wales the number of full-time medical officers is three, in Victoria three, in Queensland one and in South Australia one. The number of part-time medical officers in New South Wales is from eighty to ninety, in Victoria from sixty to seventy; in Queensland and in South Australia there are "a few". In regard to Western Australia and Tasmania no information is available. Part-time medical officers in a number of instances spend only a few hours in the factory every week. A number of large factories with between 1500 and 2000 employees make no provision whatever for regular medical attendance. This is surely a matter about which legislative action should be taken. Apart from this one would imagine that large industries would employ medical officers for their own protection if for no other reason.

The last question that should be considered is the important subject of research. Efforts were made to discover what facilities were available for research at the

university, in government departments and in private industry. In New South Wales special equipment for investigation of environmental and medical problems and other facilities are available at the School of Public Health and Tropical Medicine in the University of Sydney. The Occupational Health Unit of the School was established to function *inter alia* as a research unit to initiate industrial hygiene investigations in both the field and laboratory into the cause, nature and extent of industrial health hazards. At the New South Wales University of Technology there are some facilities for research into dust and gas analysis and illumination. In the other States no university appears to have any facilities for research in occupational health. In regard to government departments in New South Wales and Victoria, the Industrial Hygiene Divisions carry out research projects into the clinical and environmental aspects of occupational health. An important research activity is being undertaken by the Joint Coal Board in the Pulmonary Clinic at Wollongong Base Hospital. In Queensland the Institute of Medical Research and State Health Department have jointly undertaken a long-term research project into fevers prevalent in North Queensland, many of which are occupational. In other States "it does not seem that there are any significant facilities being used for research into occupational health". Private industry apparently is very slow to undertake research because we read that New South Wales is the only State in which any attention to research is given by private industry, and that even in that State there is very little that may be termed planned research.

It remains to be seen what will happen to this report. It is to be hoped that The Royal Australasian College of Physicians will distribute it widely and to bodies such as universities and State health departments which can undertake some activity. As has already been mentioned, the report has been sent to the Federal Council of the British Medical Association in Australia. It will be considered at the next meeting of the Federal Council, and it is to be hoped that some constructive action will take place.

Current Comment.

CHEESE AND THE PUBLIC HEALTH.

LARGE QUANTITIES of many varieties and imitations of varieties of natural and processed cheeses are produced in this country. Cheese is a popular, though relatively expensive, item of the diet, and its value as a foodstuff cannot be doubted. All the food products of the cow and of the farmyard in general are potential sources of dangers to man, and one of the great advances in preventive medicine in the present century has been in the hygienic control of such foodstuffs. Cheese presents particular problems, for it is processed and then stored without protection against bacteria for long periods in the warehouse, the shop and the home. Although cheese is rarely incriminated with regard to either acute or chronic diseases, it may, in fact, not possess that stolid indifference as a vector of disease which its appearance suggests. F. S. Thatcher, W. Simon and C. Walters¹ have studied the whole question of the contamination of cheese over a period of three years. The investigation was confined to Canada,

a country not unknown for its high standards of hygiene. Study was made of the milk delivered to the cheese factories, of the hygienic conditions of the factories themselves, and of 300 samples of cheese purchased in retail stores across the breadth of the country. Conventional plating techniques were used in the isolation and the numerical estimation of bacteria. The phage patterns of the pathogenic coagulase-positive staphylococci were determined, and comparisons were made of the dominant strains in the original milk and in the retailed cheese. Careful techniques were used for the isolation of *Brucella* organisms and confirmation was obtained by the inoculation of guinea-pigs. Specimens of cheese which contained significant amounts of undesirable pathogens were also tested for the presence of toxins. The sanitation of factories was estimated by close inspection, and by swabbing for the detection of bacteriological contamination. Qualitative estimation was also made of the extraneous matter found in the samples of cheese subjected to phosphoric acid digestion and in milk treated by forced filtration.

The results of these several investigations are particularly interesting. Rodent hairs were found in 22% of the cheese made from raw milk, and in 1.2% of the cheese made from pasteurized milk. The respective incidence of manure fragments was 88% and 30%, of bovine hair 74% and 4.8%, and of insects 19% and 16%. The house fly was the most common insect contaminant. *Escherichium coli* or faecal streptococci were found in values of up to seven million per gramme in practically all the samples of raw milk cheeses. The incidence of these infectants was respectively 69% and 14% in pasteurized milk cheeses. Coagulase-positive staphylococci were isolated from 45% of the raw and 13% of the pasteurized milk cheeses. *Brucellæ* were found in four of the 96 specimens tested, representing infection of Limburger, Romadour and packaged Cheddar curd cheeses. Of the milk delivered to the factories, 76% contained manure fragments, 6.4% contained rodent hairs, 60% contained bovine hairs, and insect remains were found in 38% of the samples. High ranges of infection by *E. coli* occurred in 59%, by faecal streptococci in 30%, and by staphylococci in 35.5% of the tested samples of milk. *Streptococci agalactiae* were recovered from 67%, and *Paracolobactrum* from 14% of the samples. *Salmonella* was not found in any instance. The medium standard plate count of milk exceeded ten million per millilitre in 40% of the factories, and the median counts of *E. coli*, faecal streptococci and staphylococci were frequently high. From different herds of cattle the counts of bacteria varied very considerably. Phage typing of the retailed cheeses and of the delivered milk revealed that the same dominant organisms were present in each; this indicates that cheese would serve as an efficient vehicle for the dissemination of pathogens in the original milk. The same is true of the hæmolysins, dermonecrotic and lethal toxins and enterotoxins. An estimate of the sanitary condition of the cheese factories revealed 28% to be satisfactory and 20% to be severely substandard. Of the swabs taken from surfaces which could contaminate the cheese, 89% provided a "swab slope" count in excess of 100 per square inch. In each case, *E. coli*, faecal streptococci, oral streptococci and staphylococci were obtained from more than half the surfaces. Thatcher *et alii* suggest that direct faecal contamination occurred from rodent, bovine and avian sources, and in some factories from human sources. Contamination of milk still occurred after pasteurization. Enterotoxigenic staphylococci could not only cause food poisoning in the home, but set up a process of continuing kitchen infection. More serious contamination than revealed by the survey could occur by accidental or nefarious intent. While the significance of these findings must be regarded in proper proportion, it does seem reasonable to accept them as an indication for increasing care in the handling of milk and cheese, in the pasteurization of all milk and in the zealous attention to the care and hygienic scruples of workers. There seems no reason to doubt that cheese from other than Canadian sources would be found to be at least as potentially dangerous. Cheese

¹ *Canad. J. Pub. Health*, June, 1956.

may well cause bad hygienic dreams, but it remains, nevertheless, one of the most desirable, delicious and exciting foodstuffs in the modern world.

TRAFFIC FATALITIES OVER HALF A CENTURY.

THE present heavy toll of road accidents is rightly a matter for concern, and right-thinking people will support the efforts being made to deal with the problem. However, a good deal of loose thinking goes on which serves to hinder rather than to help the solution of the problem, even though it comes from sincere and enthusiastic people. The principal corrective for this is a better understanding of the relevant facts, and for this reason attention is drawn to an analysis of traffic fatalities in Queensland since the beginning of the century reported by S. E. Solomon, Government Statistician, Brisbane, in his Bulletin No. 33 of 1956. He makes the rather arresting statement that an aspect frequently overlooked which is in the favour of the growth in motor transportation is that it has made possible a vastly increased amount of travel at a cost in lives proportionately less than that caused by the smaller amount of much less comfortable locomotion that operated in the days before motor vehicles. Few will dispute the advantages of increased opportunity to travel and greater comfort, but it will be news to many that the cost in lives is proportionately less. To illustrate his point, Solomon first presents a table of deaths (total figures) recorded in Queensland in five-year periods from 1901 to 1955 and due to injuries by, first, vehicles and second, animals (chiefly horses). As one might expect, the numbers in the first group steadily increase (apart from a sudden drop in the period 1941-1945) and those in the second group show a steady decline. The trend is similar (but much less striking for vehicles) when the deaths are shown per million of population. Solomon points out that up to the first World War, animals, mostly horses, were killing more people each year than vehicles—the vehicles involved being mostly horse-drawn. During those years the motor vehicle was an unimportant factor. Then motor transport began to develop rapidly, with the result that by the early thirties deaths caused by animals had dropped sharply to one-tenth of their previous level, while those due to vehicles had increased to take their place. When, however, we look at the figures for all deaths (vehicles and animals together) the interesting fact emerges that the level was almost constant from 1901 to 1935. There is no doubt, as Solomon states, that the average amount of road travel per head had risen greatly in this period, and "thus the motor vehicle was introduced and supplanted the older forms of transport as a much safer means of locomotion". Then came another phase, in the period from 1936 to 1940, when the total rate of fatalities rose with a concurrent steep increase in the number of vehicles. It fell again during the war years, when vehicles and vehicle-fuel were in short supply, rose a little in the five years after the war, and then rose sharply between 1951 and 1955. In this last period the number of vehicles greatly increased, and so did the amount of travel by the average person. The position is put into perspective by a table for the twenty-five years, 1931 to 1955, in which the deaths are shown in relation to the number of motor vehicles on the register. Here we find an actual decline in the figures, which are in the successive five-year periods (expressed as deaths per 100,000 motor vehicles) 788, 867, 634, 573, 595. Solomon puts it another way, stating that vehicle fatalities during the recent twenty-five years have increased more slowly than the number of vehicles in use. He continues: "If it is assumed that the amount of travel has increased in proportion to the number of vehicles, the conclusion emerges that, in spite of the mounting toll of the roads, travel has become safer. The increased number of fatalities is due to the larger volume of transport now operating."

This is obvious enough when the facts are put clearly, and the apparent paradox disappears. Possibly the idea will be disturbing to people who have grown used to thinking of road safety in certain terms, the implication of which is that the rising toll of the road is the direct fault of the motorist. Everyone will agree that every accident is one too many, and that a considerable proportion of accidents (perhaps nearly all) can be prevented, in theory at least. On the other hand travel has become simpler, more comfortable and on the average safer than it was. The essential problem of the future is, in Solomon's words, "to meet big further increases in the density of motor traffic, and at the same time to prevent its toll of deaths from keeping pace with it, and even to reduce it". The motorist should by all means be trained and encouraged in positive aspects of safer driving; but this analysis (and there is no reason to doubt that it has general application, although based on Queensland figures) offers no support to those who would wave a big stick at the individual modern motorist, deploring his recklessness in contrast to the way they did things in the "good old days".

FACIAL FRACTURES AND WIRE FIXATION.

FRACTURES of the bones of the face are not commonly found in the practice of orthopaedic or plastic surgery. How frequently they occur is unknown. However, it seems likely that they are often not diagnosed, and as the healing processes are rapid and displacement is frequently minimal, the outlook is good even when no treatment is applied. Fractures of the nasal bones are the most obvious of the injuries to the deep structures of the face. Nevertheless, untreated fractures of the face may give rise to disabling neurological lesions, cause dysfunction in binocular vision, distort the dental apparatus and give rise to gross secondary abnormalities of the accessory nasal sinuses. The cosmetic importance of facial injury cannot be over-estimated, and the medico-legal aspects of the psychiatric sequelae of facial deformity are formidable. The increasing incidence of motor-car accidents has led to a considerable increase in the importance of the accurate recognition and treatment of injury to the bones of the face. W. M. Adams and L. H. Adams¹ have for fifteen years used internal wire fixation for all facial fractures which require support and immobilization. From the long-term study of the results obtained by this method, the authors conclude that extraoral and external fixation appliances are unnecessary. The advantage of wire fixation lies partly in its simplicity. Little equipment is needed, post-operative discomfort is minimal, and the patient may be up and about within a week or ten days. External appliances attached to a headcap are uncomfortable, need repeated adjustment, restrict the patient's activity and leave scars. The authors suggest that facial fractures have increased to ten times the frequency of fifteen years ago, though the relative incidence of each different facial injury appears to be about the same. They further suggest that severe injuries and deaths in motor-car accidents might be reduced by half if the recommended safety devices were incorporated and used. Not all facial fractures require fixation, especially those of the greenstick or incomplete varieties and those in which the bone locks into place after reduction. Diagnosis should always be confirmed radiologically by special views. The authors prefer, as an anaesthetic for operation, basal anaesthesia with intravenously administered "Pentothal Sodium" and local infiltration of "Novocain" with epinephrine. Operation should be delayed if the patient is temporarily a "poor risk" to general anaesthesia. Fracture of the maxilla is usually associated with injury to other bones. Open reduction is effected through incision at the infraorbital ridge or at the lateral margin of the supraorbital ridge. Wires may be inserted through a laceration of these areas.

¹ *Am. J. Surg.*, July, 1956.

The teeth on the fractured side are fixed to those on the sound side. In bilateral maxillary fractures a loop of wire around the infraorbital ridge is threaded down over the anterior wall of the antrum into the upper sulcus over the second molar tooth. The bone is then elevated back into position and the wire is drawn taut and fixed to one of the teeth or to a dental plate. Teeth should not be removed from sockets involved in a fracture. If the infraorbital ridge is also fractured, the larger outer fragments are first fixed together, and the smaller fragments usually remain in position after reduction. Packing of the antrum is not usually necessary unless the orbital floor is displaced. For more complicated facial fractures, Adams and Adams have devised several techniques designed to reduce the fracture and fix the fragments with stainless steel wire. Nasal fractures are reduced and immobilized in the usual way. After fixation oral hygiene is of the utmost importance. Antibiotic therapy is always given in the presence of facial fracture. The wires remain in place for from three to five weeks and then, after the loop is cut, the wires are removed through the mouth.

TRANSFUSION OF BLOOD INTO THE PERITONEUM.

MANY years ago investigators demonstrated the powers whereby both fluids and small particles might be absorbed from the peritoneal cavity. It was suggested that particles were absorbed into the lymphatic system through minute stomata in the diaphragm. In animal experiments blood was successfully transfused into and rapidly absorbed from the peritoneal cavity, and, subsequently, the method was successfully employed in the transfusion of children with citrated blood. More recent studies using red cells tagged with radioactive iron have shown that the red cells are absorbed by all the serosal surfaces and the erythrocytes pass through the lymph nodes without undergoing phagocytosis. The procedure does not appear to influence the survival time of the transfused red cells. However, this method of transfusion has never been popular, and since the introduction of techniques designed to give fluid by the subcutaneous route, together with the increasing attention paid to the preservation of veins used for blood transfusion, the transfusion of blood into the peritoneum is now rarely contemplated. Nevertheless, there are occasions when this method has particular advantages. For patients, especially children, who require frequent transfusions of blood the repeated traumatic interference with a dwindling number of veins may cause great anxiety to the medical attendant and considerable distress to the patient. Such a case has been reported by M. E. Waite, D. D. Colucci and J. Glaser.¹ The patient was treated from early infancy for the condition of *thalassaemia major* of an hereditary nature. Transfusions of blood by the intravenous route became increasingly difficult, and the transfusion of citrated whole blood into the peritoneal cavity was eventually resorted to. The apparatus used employed gravity flow, through a filter and three-way stop-cock, into a 20-millilitre syringe connected to the transfusion tube and needle. The needle, slightly blunted, was inserted into the right lateral margin of the *rectus abdominis* muscle and into the peritoneal cavity. Saline was first injected to confirm the position of the needle in the peritoneal cavity and then the required amount of blood was injected. The needle was withdrawn and the patient was observed for twelve hours and then discharged. In their particular patient, Waite *et alii* made the interesting observation of the occurrence of Cullen's sign at the site of an umbilical hernia. The procedure has been repeated several times on this patient with no untoward reaction and with a satisfactory attainment of the desired hemoglobin value.

In discussing this method of transfusion, Waite *et alii* report that the findings of other workers suggest that blood does not irritate the peritoneum and adhesions are not formed. Provided that a short bevel needle is used, there

is no danger of perforation of the bowel. Because of the slow absorption of the blood the quantity given is not so critical as by the intravenous route, but at the same time the quantity may be limited by distension of the abdomen. As there is a danger of transient salt depletion and shock, the solution should be isotonic. The blood must, of course, be cross-matched in the usual way, and other workers have reported little or no discomfort when blood is transfused into the peritoneal cavity. One precaution not mentioned by Waite *et alii* is obviously the need for a strictly aseptic technique. The blood system is famously resistant to potential infection introduced by faulty transfusion by the intravenous route; considerably more care would be required in the invasion of the peritoneal cavity.

SUICIDE THROUGHOUT THE WORLD.

THE state of mind which induces an individual to seek to escape from the world by deliberate self-destruction has been extensively studied. Some of the motives which lead the patient towards suicide were discussed recently in this journal.² The intrusion of exhibitionists and others by whom a suicidal attempt is simulated, has lent to the act of suicide a drama which, in the genuine case, it rarely merits. The genuine suicides usually die quietly and forgotten, having made just sufficient preparation to ensure the success of their desperate venture. Nevertheless, suicide is still frequently associated in thought with the emotionally labile and the outwardly distraught. This illusion of the association of suicidal tendencies with apparent national and racial temperament is completely confounded by a study of a recent publication of the World Health Organization.³ This sets out the results of the compilation of statistics obtained from 25 countries of death rates from suicide in the present century. Warning is given that various factors, such as local reluctance to certify a death as suicide, must be borne in mind in the interpretation of the figures. According to the statistics, 71,000 to 72,000 persons died by their own hand in these countries each year, a suicide rate of 17 to 18 per 100,000 adults. In every country men are more prone to suicide than women, varying from four to one in Norway to two to one in Japan. The mortality rate has been devised from 100,000 of the population, and also separately for each sex. Perusal of the figures reveals that Japan, Austria, Denmark and Switzerland each have suicide rates well above 20 per 100,000, with Germany, Finland and Sweden not far behind. In the middle range with about 10 per 100,000 are England and Wales, Australia, European South Africa, and European United States of America, with New Zealand lagging below nine. Even lower mortality rates are recorded for Canada, Ceylon, Spain, Italy and Scotland. Still lower rates are recorded for non-white Americans and for Northern Ireland, while the lowest figure of 2.0 per 100,000 is recorded for Eire. There are occasional exceptions to the general topsy-turvy state of expectation, such as in the cases of Norway and Holland which have low figures; but on the whole suicide seems to be the characteristic of the emotionally self-controlled, while the labile and unpredictable Latins and Celts are more careful with their lives. A closer study reveals that the highest rates of suicide occurred about 1930 at the time of general economic depression, and in several countries the suicide rate is decreasing, especially amongst men. In recent years suicide has been prevalent in women in middle age and in men in old age. The reduction in suicide has occurred particularly in young white Americans, Germans, French, Irish, young Italians, male Dutch, young Scotsmen, Englishmen, and young New Zealanders. Wisely the study makes no attempt to relate these statistics to the national differences of culture, social and economic conditions. Apparently no statistics were available from the Slav countries.

¹ M. J. AUSTRALIA, May 26, 1956.

² WHO Press, July 16, 1956.

³ Am. J. Dis. Child., June, 1956.

Abstracts from Medical Literature.

OPHTHALMOLOGY.

Treatment of Cysts of the Iris with Electrolysis.

P. J. KENNEDY (*Arch. Ophthalm.*, April, 1956) reports on the use of electrolysis in the treatment of six patients with cysts of the iris. In five patients cyst formation followed the extraction of a cataract. The electrolysis needle was placed through a knife-needle incision into the centre of the cyst. The current was turned on, 10 to 15 milliamperes being used. The electrolysis was continued until the cyst was filled with hydrogen bubbles. In the use of this technique the needle should not be allowed to penetrate and rupture the free wall of the cyst, because there may be some damage to the endothelium as the hydrogen comes into contact with it.

Keratoplasty with Punch Forceps.

H. SJÖGREN (*Tr. Ophthalm. Soc. U. Kingdom*, 1955) describes the use of a punch for keratoplasty. This instrument gives a graft and hole of the same size and with perpendicular sides; Deccemet's membrane and the endothelium are sharply cut without fringes and irregularities. So far the author has used the instrument for four-millimetre grafts, but a five-millimetre instrument is in production.

Causes of Acquired Paralysis of Ocular Muscles.

C. W. RUCKEN *et alii* (*Am. J. Ophthalm.*, June, 1956) have reviewed 653 patients with acquired nerve palsy seen at the Mayo clinic. Of these, 221 had paralysis limited to the third cranial nerve. No cause was found in 70 cases, head injury accounted for 39, and aneurysm for 45. Syphilis accounted for only five cases. When the oculomotor paralysis was attributable to neoplasm or aneurysm, the pupils were affected in practically every case; when it was due to syphilis, the pupils were affected in every case. When the basis was vascular, pupillary reactions were normal. There were 40 cases of fourth nerve paralysis, and in 15 no cause was found. Head injury accounted for 12 and vascular disease for eight. There were 246 cases of sixth nerve paralysis with no cause found in 90. Head injury accounted for 34, neoplasm for 38, vascular disease for 40 and aneurysm for 11. The large proportion of cases in which the cause was undetermined is not surprising as determination of the cause may not be possible until other signs appear.

Anesthesia in Cataract Surgery.

E. P. BURCH (*Am. J. Ophthalm.*, March, 1956) reports on anesthesia in cataract surgery. The psychotic, the extremely hard of hearing, and the very apprehensive patient are best operated upon under general anesthesia. For general anesthesia the author recommends "Pentothal" and d-tubocurarine hydrochloride. Post-

operative nausea is not frequent, especially when one of the anti-nausea-acting drugs has been administered. The author believes that post-operative nausea and vomiting may be due to swallowing pilocarpine which has been instilled into the eye after round pupil extraction. For local anesthesia, the author uses a 1% solution of "Xylocaine" or a 2% solution of "Novocain" as a retrobulbar injection; when a very soft eye is desired, hyaluronidase is added. The author prefers "Xylocaine" to "Novocain".

Ophthalmic Use of "Neosporin".

J. W. HALLET *et alii* (*Am. J. Ophthalm.*, May, 1956) have studied the effect of "Neosporin" on various ocular infections. The ointment, which contains polymyxin B, bacitracin and neomycin sulphate, was applied four times daily. Thirty-five patients with acute and subacute catarrhal conjunctivitis were treated, and of these 32 were cured or much improved in five to seven days. Of 16 patients with chronic catarrhal conjunctivitis, 11 were improved or cured. All patients with marginal blepharitis and blepharo-conjunctivitis were cured or improved, as were those with acute hordeolum. Patients with superficial punctate keratitis, chronic dacryocystitis, acute follicular conjunctivitis, epidermic kerato-conjunctivitis, herpes simplex conjunctivitis, and phlyctenular conjunctivitis were treated, and most were cured or improved. "Neosporin" was successful in most instances of Gram-positive infections, and in all the Gram-negative infections treated. Most virus infections, when treated, responded.

Corneo-Scleral Trephine Operation.

J. S. SHEPMAN AND C. M. LUCE (*Arch. Ophthalm.*, June, 1956) are of the opinion that when surgery does become necessary in chronic simple or "wide angle" glaucoma, then the corneo-scleral trephine operation is the operation of choice, provided it is carried out with the proper considerations. For patients under the age of fifty years, the authors recommend a two millimetre blade; in patients over fifty-five years, a 1.5 millimetre blade should be used. The authors prefer local anesthesia; after operation they recommend that atropine be instilled into the operated eye daily until the eye is white.

Diathermy or Scleral Resection.

C. D. SHARLAND (*Tr. Ophthalm. Soc. U. Kingdom*, 1955) reviews the results of 430 cases of detachment of the retina. From an analysis of these cases he is able to lay down indications for diathermy and scleral resection. The diathermy operation should be performed in the following cases: holes without detachment; unruptured retinal cysts; detachments due to rupture of a retinal cyst; detachments in myopia associated with a single hole which respond well to posture; general retinal detachments which respond well to rest and double padding. Scleral resection, usually lamellar, should be performed in the following cases: senile detachments; detachments of considerable chronicity, especially old-standing inferior detach-

ments showing multiple *striae retinae*; detachments occurring in aphakia; detachments occurring in myopia, especially those with multiple and widely spaced rents in front of the equator of the globe; diathermy failures; detachment associated with retraction of the vitreous; traumatic detachments and detachments which do not respond well to rest and double padding.

OTO-RHINO-LARYNGOLOGY.

Some Aspects of Fenestration.

F. HARRERT (*Arch. Otolaryng.*, April, 1956) has reported variations in technique developed in the course of over 200 fenestration operations. Anatomical considerations make it appear that a factor in closure of the fenestra could be that of failure of apposition of the tympano-meatal flap to, or contracture from, the inferior margin of the fenestra. It was decided to ensure a complete and firm contact between skin flap and fenestra even if the thicker skin of the tympano-meatal flap covered the fenestra. One to three "Parresine" gauze pledgets were wedged between the malleolar folds and incudal notch laterally, and the medial wall of the tympanic cavity medially, thus forcing Shrapnell's membrane into the tympanic cavity. Mass packing of pledgets against exposed areas of flap ensured apposition of the flap and the superior margin of the fenestra. The mucosa over the horizontal canal and upper half of the facial canal was reflected downwards over the facial canal. Since the institution of this technique there has been less troublesome bleeding from small vessels near the facial canal, for the polishing burr is applied only to the avascular bony covering of the external semicircular canal. The entire bony area between facial canal and fenestra is exposed for contact with the tympano-meatal flap; this ensures firmness of union. Great care is exercised to prevent injury to the endosteum deep to the edge of the fenestra, and an attempt is made to leave a very narrow margin of endosteum exposed for contact with the meatal flap. The entire cavity is lined by split-thickness skin grafts, which are applied on fine-mesh petrolatum gauze like postage stamps; these are held closely in place by larger "Parresine" gauze pledgets. The grafts should be long enough to protrude over the edge of the incisions within the external canal; this ensures contact with exposed temporal fascia and soft tissues of the incision and skin edges, which are frequent sites of granuloma formation. The author suggests that the first dressing should be performed on the twelfth to the fourteenth day, when all packs should be carefully removed so as not to disturb the grafts. Not until a period of three weeks has passed should thorough cleansing of the cavity be performed, followed by insufflation of a 1% mixture of iodine in boric acid powder.

Therapy and Prophylaxis of Otitis Externa.

H. E. BRANCA (*Arch. Otolaryng.*, May, 1956) states that only recently has there been some explanation for the

recurrent nature of external otitis. The organism responsible has been found in the majority of cases to be the *Pseudomonas bacillus*. The hemolytic *Staphylococcus aureus* is a less frequent factor. Moulds as pathogens are reported in less than 10% of all cases. Hot and humid climates seem to predispose to the disease. A shift in pH towards alkalinity in the canal has been demonstrated, and favourable results have been observed with the use of mildly acid drugs including vinegar. The absence of cerumen in established cases has been explained by the demonstration of destruction of the normal glandular structures in skin biopsies. It is suggested that atrophy of the ceruminous glands may be the basic factor in external otitis. The dryness of the skin then initiates pruritus. The trauma from scratching leads to secondary infection. The absence of normal secretions also reduces the barriers to fungal or bacterial invasion. The more prolonged the infection the more the destruction of the glandular element occurs. The cycle of events may be broken by (i) a wax substitute, (ii) an antipruritic and (iii) specific drugs. A satisfactory method of therapy is as follows: The canal is cleansed, and a wick, saturated with polymyxin B sulphate ("Aerosporin"), is inserted. This preparation is most effective against *Pseudomonas* and Gram-negative organisms. It also contains acetic acid, which helps to restore the normal pH of the canal. For home use the patient uses, as drops over the wick, a solution of "Chloromycetin" 15 millilitres and polymyxin 25 milligrammes. The wick is removed after two days, and administration of the drops is continued for one week in all, when, in most instances, the canal is free of infection. The patient is then given 10% boric acid ointment to be used three times weekly. In some patients who have not been cured by this routine a coagulase-positive *Staphylococcus aureus* has been grown. These patients are classified as having a localized allergy to the staphylococcus exotoxin; they may be satisfactorily treated by desensitization and by the local use of corticosteroids with neomycin. Hydrocortisone suppresses itching, and antibiotics prevent local bacterial invasion. Where fungi are present, metacresyl acetate with 1% thymol is applied locally. For home use this is diluted by half with olive oil.

Laryngo-oesophagectomy.

M. L. Som (*Arch. Otolaryng.*, May, 1956) considers that carcinoma of the post-cricoid region is best treated by surgical extirpation. Lateral pharyngotomy, with preservation of the larynx, is a limited operation with disappointing results. Radical excision of a segment of the pharynx and upper part of the oesophagus, together with the whole of the larynx, has more recently been performed. Reconstruction of the pharynx requires an extensive plastic repair and prolonged stay in hospital. Primary reconstruction is desirable where practicable in order to avoid the unpleasantness of pharyngotomy. Split-thickness skin grafts on a plastic or tantalum tube may be successfully employed to reconstruct the continuity of pharynx and oesophagus. The development of strictures at the

points of anastomosis is a constant source of trouble. A case has been reported in which a segmental pharyngo-oesophagectomy was performed. The larynx was separated from the oesophagus together with the carcinoma by splitting the party wall and by freeing the anterior oesophageal mucosa from the cricoid. The larynx was then used as a tube to reconstruct the continuity of the pharyngo-oesophagus. A permanent tracheostoma was created below the line of resection. Such preservation of the entire larynx is rarely feasible, since the post-cricoid carcinoma tends to infiltrate the cartilage. Whereas in most instances of carcinoma of the hypopharynx the cricoid and posterior wall of the larynx are involved, the anterior portion of the larynx is free of disease. It thus would seem possible to preserve the anterior half of the larynx in most cases. This remaining structure, together with its mucosa, could be preserved to form the anterior half of the newly constructed oesophagus; the posterior half is supplied by a split-skin graft resting on the pre-vertebral fascia and sutured to the margins of the residual larynx laterally. This was in fact done in a sixty-years-old woman, with a satisfying result and a relatively short stay in hospital. The thyroid cartilage was excised; the remaining anterior portion of the larynx and trachea were then used as an autograft to form the anterior wall of the new pharyngo-oesophagus. Care was exercised to preserve the superior laryngeal vessels. A Negus-type "Latex" mould was inserted, and a Thiersch graft was wrapped round this posteriorly.

Vitamins and Bleeding After Pharyngeal Operations.

H. P. HARKINS (*Ann. Otol., Rhin. & Laryng.*, December, 1955) states that the "Koagulations Vitamin", a fat-soluble naphthoquinone substance found particularly in green plants, was first detected in the study of a disease in chicks which was characterized by hemorrhages and prolonged clotting time of the blood. The defective clotting power was restored to normal by the injection of a concentrated solution of vitamin K. Vitamin K is concerned in the production of prothrombin. Hypoprothrombinemia is produced in rats by the administration of sodium salicylate or acetylsalicylic acid. Vitamin K protects the animals. A similar effect has been demonstrated in blood studies of human beings. In animal studies of the healing of wounds, the process of healing is inferior in those animals which have been deprived of a normal supply of cevitamic acid. Vitamin C has been found to have a definite effect upon the fibroplastic healing and general reparative processes in the human body. Many animals, man included, cannot synthesize vitamin C and must depend on extraneous ascorbic acid for their needs. Increased utilization of vitamin C occurs during infections and operative procedures. Vitamin C and vitamin K combined together appear to give the patient convalescing from tonsillectomy and adenoidectomy the best chance to recover without the complication of bleeding. A study was carried out on 200 children undergoing removal of the

tonsils and adenoids. The patients were from five to thirteen years of age. The bleeding and clotting times of each child were found to be within normal limits. One-half of the children were given vitamin C and vitamin K before and after operation. Of this treated group, acetylsalicylic acid was administered to 50 patients for the relief of post-operative pain. The remaining 50 were denied the use of salicylates. The 100 patients who constituted the control group received neither vitamin K nor vitamin C but were permitted to use acetylsalicylic acid during convalescence. Of the 50 patients who received vitamins and were allowed to use salicylates, in only one was there any post-operative bleeding, a minor bleeding from the adenoid area. Of the 50 who received vitamins but no salicylates, two children suffered minor bleeding six and seven days after operation. Of the remaining 100 children who received no vitamin medication but were permitted to use salicylates, 14 suffered postoperative hemorrhages and several required readmission to hospital and the transfusion of blood. Careful bleeding and clotting time studies were made on all the patients included in the study. These tests failed to indicate impending bleeding in the children who suffered postoperative hemorrhages. Vitamin K and vitamin C, when given before and after operation, reduced the incidence of postoperative hemorrhage. No toxic symptoms were noticed.

Thrombocytic Purpura Due to Quinidine.

E. E. NACHLAS (*Arch. Otolaryng.*, December, 1955) explains that thrombocytopenic purpura is characterized by the finding of multiple hemorrhages into the skin and mucous membranes. One of the earliest indications may be epistaxis. Laboratory findings in this disease include a prolonged bleeding time, poor clot retraction, an increase in capillary fragility, and a decrease in circulating platelets. Blood dyscrasias associated with bone marrow disease, splenic dysfunction, and toxic factors operating on the megakaryocytes, may have to be considered. The latter may occur in infections, chemical poisoning, and drug and food allergy, and after irradiation. It is important to recognize the noxious agents and to bring about their removal. There have been 15 cases of thrombocytic purpura reported as due to quinidine. An additional case is that of a woman aged seventy-three years. Quinidine was administered on account of heart disease associated with respiratory tract infection. On the fifth day epistaxis commenced and points on the nasal septum were cauterized. The bleedings became more severe and were associated with hematuria, melena and petechial and bullous lesions in the mouth. Platelets were absent from the blood. Quinidine was discontinued and within six hours the epistaxis was much less severe. Cortisone was given in a dosage of 75 milligrammes four times daily. All signs of bleeding disappeared, platelets reached 24,000 per cubic millimetre in twenty-four hours and 510,000 in one week. It is stressed that, in cases of persistent epistaxis, blood counts, with prothrombin determinations and platelet counts, should be a routine step in investigation.

Clinico-Pathological Conferences.

A CONFERENCE AT SYDNEY HOSPITAL.

A CLINICO-PATHOLOGICAL CONFERENCE was held at Sydney Hospital on June 19, 1956, the medical superintendent, Dr. NORMAN ROSE, in the chair. The principal speaker was Dr. P. GREENWELL, an honorary assistant surgeon of the hospital.

Clinical History.

The following clinical history was presented:

The patient, a sixty-two-year-old seaman, became ill on board ship a few days after leaving Port Moresby bound for Sydney. He felt off colour and had anorexia. Next day he had constant umbilical and subumbilical pain, which became worse, but he had periods of comparative freedom and was able to continue at his work for three days. The anorexia and abdominal pain continued. His bowels opened once or twice daily, normal motions being passed. Two days before his admission to hospital the pain became worse, reaching a climax on the night before admission, when it was localized around the umbilicus and he vomited many times. He was then passing frequent motions with blood and slime.

The history also revealed a transient attack of precordial pain two weeks previously, a constant moderate intake of alcohol and nocturnal frequency of micturition for the past two years. There were no symptoms relevant to the respiratory, cardio-vascular and nervous systems. There was no weight loss. The family history appeared irrelevant. No history relevant to amoebiasis could be elicited.

The ship's surgeon noticed a dry coated tongue, foul breath, distended silent abdomen, clear hernial orifices, and tenderness and hyperaesthesia in the right iliac fossa. He considered the diagnosis to rest between a ruptured appendix and lower bowel obstruction.

The casualty surgeon found a distended abdomen, tympanic over the stomach area, with lower abdominal tenderness and a positive release sign. Bowel sounds were heard, and dullness was thought to be due to fluid. Blood and mucus were found on the examining finger. A diagnosis of pelvic abscess and peritonitis was made.

Examination in Sydney Hospital revealed him to be a plethoric, elderly man lying flat in bed, moaning with pain. The tongue was furred and dry and the breath foul. The abdomen was grossly distended and asymmetrical with a bulge in the right flank, where there was a large tender mass thought to be an enlarged liver. The well-defined edge was S-shaped, extending from the left hypochondrium to the right iliac fossa, crossing the mid-line above the umbilicus. The mass was dull to percussion. Elsewhere there was no tenderness, guarding or rigidity. No free fluid could be demonstrated in the peritoneal cavity. Bowel sounds were audible on the left side. He vomited about two ounces of green, foul-smelling fluid. The blood pressure was 135/100, the temperature 100° F. and the pulse rate 105 per minute. The results of examination of the cardio-vascular, respiratory, nervous and hemopoietic systems were negative. The spleen was not palpable. The urine was acid, contained no sugar, albumin or blood, and had a specific gravity of 1.030. Digital and proctoscopic examination of the rectum revealed slimy, blood-stained faeces, and a sigmoidoscope was passed freely to a distance of 20 centimetres without any ulcers or other lesions being seen.

A plain X-ray examination of the abdomen with the patient in the supine and upright positions was reported as showing "no fluid levels or definite distended coils". An examination of the blood revealed a haemoglobin value of 128% (19.2 grammes) and a white cell count of 14,800 per cubic millimetre (neutrophils 79%, lymphocytes 14%, monocytes 7%). No comment was made regarding the red or white cells.

An immediate operation was performed, the results of which will be reported at the meeting.

Clinical Discussion.

Dr. NORMAN ROSE: This afternoon the speaker will be Mr. Peter Greenwell, honorary assistant surgeon at this hospital. I do not know the case. I have studied it closely, and I consider that no more difficult problem has ever been placed before a commentator. I present to you Dr. Greenwell.

Dr. P. GREENWELL: Mr. Chairman, ladies and gentlemen, I have been asked to lead off the discussion today in consideration of this patient; and although I appreciate that

you all have the précis before you, and I am cognisant of the fact that many of you will have studied this in detail, I would still like to reiterate the symptoms and signs with a view to appreciating them. Firstly, the age of the patient (sixty-two years) tells us little, except that it does place our subject in a certain age group. Secondly, I found the duration of symptoms a little indefinite, in that the history commences with a story three days following departure from Moresby on a ship bound for Sydney. This places the length of history somewhere between seven and ten days and possibly less. In all events, the history appears to me to be unquestionably an acute one and divides itself according to symptoms into two specific periods—an initial period of three days, during which time the symptoms were not as apparent as they were in the period of forty-eight hours immediately prior to admission, when the clinical picture became far more acute.

There is no relevant antecedent history, and the only past history of note is a negative one, in that this patient had not suffered from amoebiasis in past days. We are given certain other information. An attack of precordial pain had been suffered, but I frankly cannot relate this to the case before us. Possibly some of the physicians present might be able to associate this with the story that we unfold. Furthermore, I think it is important at this point to note that there was no loss of weight—a fact which I think negates the possibility of serious past disease in the form of malignancy.

The onset was represented by vague symptoms of malaise, anorexia and some abdominal pain, which were not sufficient to warrant this man ceasing his daily activities. And then there was an increase in the symptomatology associated with marked constitutional effects, vomiting, diarrhoea and the passage of blood and mucus *per rectum*.

If we now turn to the findings, to analyse and appreciate them, we come to realize the importance of this reiteration. Three medical officers, within a period of some twenty-four hours, examined this man and made findings, some of a similar nature and some diametrically opposite to one another. For this reason I think it is necessary to establish a composite story which most nearly represents the truth. The general appearance of the patient during these twenty-four hours was one of an obviously sick man. I judge him to be dehydrated, as indicated by his tongue on examination and suggested by the fact that he had been vomiting consistently and had diarrhoea during this period. He was in pain, and this pain was of a constant nature. In the more serious phase the patient was certainly writhing, but there is little suggestion of definite colic. Regarding the more controversial points of the findings on examination of the abdomen, I think it was agreed by all three that distension was apparent and of considerable degree. However, the examiners seemed to be at variance as to the cause of the distension. One regarded it as being due to fluid and also described tympany, which rather indicated bowel distension. The last examiner, probably the most reliable one, considered the distension was due in part to a mass in the right hypochondrium extending to the left side. Furthermore, I think his impression was that there was some distension of bowel associated with this mass. This leads me to discussion of the findings in respect of this mass. It was not described by the medical officer aboard ship. The second medical officer, the casualty surgeon, did describe a dullness presumably in the flanks, which I think was probably indicative of this mass, and the third member defined a mass extending from the left hypochondrium into the right iliac fossa. This rightly or wrongly he presumed to be an enlarged liver, and he described the lower edge of this mass as being S-shaped or irregular. In our consideration of the diagnosis I think we will have to bear in mind the possibility of this man having an enlargement of the liver unassociated with the present condition, but it would be more appropriate to associate this finding with the diagnosis. There were differences also in the findings on auscultation. The ship's surgeon said the abdomen was silent, the casualty surgeon said there were bowel sounds present, and the third medical officer considered the bowel sounds were confined to the left side. This latter differential finding is one which is indicative of pathological change on the right side with activity in the remainder of the abdomen.

Rectal and sigmoidoscopic examinations help us in some respects. They exclude the presence of pathological processes in the lower reaches of the large bowel and confirm the presence of blood and mucus described in the history. These symptoms and signs were reflected constitutionally by an increased pulse rate and raised temperature of slight degree, and I do not think there is any question that there was dehydration.

We have information regarding the pathological findings and X-ray examination. The X-ray appearance is rather hard to correlate with the findings. I would like to think that this patient did have some bowel distension which should have shown radiographically. Perhaps the radiologist can explain this negative finding. Furthermore the white cell count is interesting, in that it showed a neutrophilia.

In considering the differential diagnosis I would like in the first place to talk about acute bowel infections.

I would welcome comment and correction from physicians present here today, particularly those who have had practical experience in the war years of these infections. Dysentery, which is defined as the passage of watery stool associated with blood, colic and tenesmus, must, I think, be considered. Bacillary dysentery is the more likely of the two, as it is an acute disease associated with abdominal pain and frequent bloody motions. This person had been recently in an area where this disease is apparent. There are certain fulminating forms of amebiasis that also may present with diarrhoea and abdominal pain of a severe and acute nature. The temptation of associating liver enlargement from amebic manifestations in the liver with this diagnosis is not tenable, for amebic hepatitis is a sequel to established disease, and there is no past history of amebiasis here. Ulcerative colitis can present in acute phases, but again one would have anticipated antecedent disease, and there is no history of this. The age, too, and the background are not consistent. These diagnoses, however, fall down, in that they are not generally associated with a palpable mass of the type described; and furthermore in my own experience, small though it is in this respect, I have never seen the association of distension with these conditions.

There are lesions of the right side which I think we should consider. They are chronic conditions characterized at times by acute manifestations—chronic lesions of the ileo-caecal regions, namely, tuberculosis and regional enterocolitis or Crohn's disease. Firstly, one would have expected some past manifestations of these troubles, if these diagnoses are to stand. Moreover, tuberculosis seldom, if ever, presents with the passage of blood and mucus in the stool. Age is against a diagnosis of regional enterocolitis, and the acute manifestations of this disease are usually not those first encountered. They are late occurrences in the course of this chronic pathological state, and seldom, if ever, is there associated profuse bleeding *per rectum*.

A third group of diseases I would like to consider are surgical and, I think, approach more closely the diagnosis. They are the right-sided inflammatory suppurations which form abscesses or phlegmons, and such conditions as acute appendicitis with suppuration, acute Meckel's diverticulitis, perforation of carcinoma with a formed pericolic abscess or the occurrence of peridiverticulitis associated with acute diverticulitis are considered here. The latter is usually found on the left side of the bowel, but may occur on the right side. These inflammatory conditions (carcinoma, of course is secondarily inflammatory in this respect) can give rise to localized abscess formation, which could explain some of the findings made by the examiners. The differential auscultation and other findings could be explained by the localization of this infection to one quadrant of the abdomen—allowing intestinal activity in the remaining quadrants. It is difficult, though, to explain the passage of blood and mucus in these cases. Certainly it is appreciated that the formation of a pelvic or intraperitoneal abscess involving the more distal reaches of the large bowel may give rise to congestion and the over-production and secretion of mucus. It is described (though I have never seen it) that an inflammatory process may involve such a loop as to produce actual exudation of inflammatory products including blood. I would presume such a mechanism to occur about the eighth to the twelfth day. However, we have determined the history, very reliably, to be of a shorter period.

The ship's surgeon has some justification for his opinion. He thought that this was a case of ruptured appendix, probably suggesting in his own mind the possibility of localized abscess formation. In truth the early history is like that of an appendix, and it could just as well represent the onset of any one of these conditions I have mentioned. Finally I would just like to say that the distension might well be explained in this set of circumstances by bowel distension as a result of a paralytic or an obstructive state.

The last group of conditions I would like to consider are those of bowel involvement where the vessels are implicated—namely, strangulation and other forms of vascular obstruction. Strangulation due to bands and adhesions would not give rise to the symptoms we have detailed. The band

usually obstructs and prevents the passage of anything distal to the site of obstruction. However, mesenteric vascular occlusion should be considered. There are forms which present intermittently and finally terminate in severe massive vascular occlusion. The patients I have seen with this condition have been much more dramatically ill than this man. The onset is usually one of shock, collapse, and generalized abdominal pain with a completely silent abdomen. Moreover, it is difficult to explain the presence of the lump under these circumstances. Perhaps we can postulate that this might be the involved segment of bowel being felt under the examining hand. However, I have not in the few cases I have seen been able to detect this sign clinically, and I think it is an unlikely explanation.

The last condition I would like to consider is that of intussusception. When this word is mentioned one's mind passes to the early age groups. Nevertheless, I have seen two adult cases of intussusception, and I feel it must be considered here. One case I remember well. A seventeen-year-old boy had given concern as to his intraabdominal condition for twenty-four to thirty-six hours. We knew he had some intraabdominal mischief, for he reflected this in his pulse and slight temperature, but he had no evidence of severe pain, and his findings were initially very equivocal. However, he developed a very sudden onset of severe pain, with a rising pulse, and this determined operation. At operation he was found to have a well-established intussusception.

There is no question that most of the factors here fit the picture of intussusception, except that it is rather difficult still to explain the lump which was apparently in the right hypochondrium. Could it be that the medical officer concerned incorrectly determined the mass in the right hypochondrium and that this represented an elongated mass of involved bowel? I do not know, but I offer this as the probable diagnosis.

I feel at this time that I am expected to discuss treatment—but short of saying that I consider this patient should have been prepared for operation, I would like to know the diagnosis before discussing specific treatment measures. Perhaps you will permit me to speak in respect to treatment once the diagnosis is known.

There was an erstwhile and famous surgeon of this city of whom it was said that he seldom established a pre-operative diagnosis, but he invariably knew when to operate. If I could take on his mantle for a moment, I would find myself saying that I would operate on this case.

Dr. ROSE: I would like to ask the audience for their idea on this case. Could we have some comments from the physicians?

Dr. W. EVANS: I would like firstly to compliment Dr. Greenwell for his very able presentation of this case. It seems to me that the first question to decide is whether that mass is due to the liver or is bowel swelling. I think it is unlikely to be liver, because it extends a very long way from the left hypochondrium to the right iliac fossa, and there is no jaundice. If it were liver, I should think the possibility of amebic abscess following amebic dysentery would be the first one, and the second would be a periappendiceal abscess with an abscess in the liver. I think that the appendiceal abscess would be the most likely one, but with that I think the leucocyte counts would have been greater than 14,000 per cubic millimetre, and that the constitutional symptoms would have been worse. So that I think it is not so likely to be liver, and is more probably bowel. I agree with Dr. Greenwell's comments that it is unlikely to be a dysentery, and then the other probabilities are volvulus or intussusception. Those cannot be ruled out, though there are others that are perhaps more possible. A point has been mentioned that there was a history of precordial pain two weeks before. I think one must consider firstly the possibility of a coronary thrombosis and myocardial infarction with a mural embolus causing blockage of mesenteric vessels and intestinal obstruction. That could fit the symptoms—the blood-stained mucus in the bowel, the distension and the large mass which was felt in the upper abdomen. So that I would put this number one. The second possibility is volvulus or intussusception.

Dr. K. B. NOAD: I think that this patient either had a volvulus or intussusception. In the beginning it was something which apparently righted itself, because the protocol states that he had periods of comparative freedom and was able to continue at his work for three days. Therefore it seems as if whatever the trouble was it either would relieve itself or, in the case of a volvulus, would undo itself so to speak, and the symptoms would pass off. I am inclined to favour a volvulus here because of the large mass which is

referred to in the protocol. It says "a large tender mass", and I think this would be more probable with a volvulus than an intussusception. I also thought along the same lines as Dr. Evans. Could this have been an embolism from a mural thrombus? But I cannot reconcile the initial periods of comparative freedom. So I excluded that, and I rest on this patient having a volvulus.

DR. ROSE: We have another body of physicians on our right side. Are there any comments from them?

DR. W. L. CALOV: Mr. Chairman, I have an idea that I know something about this patient, and before I say anything, could I ask if it was recent?

DR. HIRST: Eleven years ago.

DR. CALOV: Then I am free to speak. In the first place this is a surgical emergency. It is not a dysentery. My reason for saying this is that he had symptoms for several days before he had diarrhoea. With an acute dysentery, and this could only be a bacterial dysentery, you sometimes get a little abdominal pain and some systemic disturbance—an increased temperature and pulse rate, and a dry tongue—and the bowels may be confined for twenty-four hours. Then you get the burst of diarrhoea, possibly with blood. Here we do not know whether the man was passing any faecal material or whether it was only blood and slime, and it appears to me it was coming from some lesion in the large bowel; I feel pretty sure that it was either intussusception or a volvulus. The possibility is that he had had some lesion, there in the first place. He might have had a carcinoma or a polyp or something of the kind, which started the trouble off. Dr. Greenwell mentioned the possibility that it might be amebic dysentery. I have to concede the possibility, but I would think that there would be some mention of faecal material, and foul faeces at that. We cannot overlook the fact that he vomited foul material, which to my mind indicates that he had intestinal obstruction and that it was either a volvulus or an intussusception.

DR. E. H. STOKES: I do not have the opportunity of coming to these meetings very often, but I want to congratulate Dr. Greenwell on the way he presented the case. It would appear that this is a surgical emergency and that the various speakers before me have explained the case in great detail. It is really a matter of trying to sum up the possibilities. There is one possibility that has not been mentioned very prominently; that is diverticulitis with an abscess. Diverticulitis may burst, an abscess form, and the symptoms would be perhaps consistent with this. Volvulus, in my experience, is more acute, and the pain is more severe. The course is usually more rapid than in this case. Thrombosis of the mesenteric vessels has also been considered very carefully. I would say that it is not altogether likely to be an intussusception. The mass situated below the liver is evidently not the liver, because the edge was S-shaped. The edge of the liver is usually quite definitely palpable unless there is considerable abdominal rigidity. However, it is difficult in these acute abdominal cases to be sure of the findings. I will exclude those medical conditions that Dr. Greenwell mentioned, and I would say the diagnosis rests between diverticulitis with abscess and thrombosis of the mesenteric vessels. It is very likely to be diverticulitis with abscess.

DR. ROSE: Are there any other medical opinions. Mr. Alan Sharp, it is too rarely that we see you at these meetings. Have you something to say?

DR. ALAN SHARP: I consider this case presents quite a problem in diagnosis, and I, too, would like to congratulate Dr. Greenwell on the way he has handled it. At the outset I must say that I would like very much to see and examine this patient myself, because, as the history unfolds, I find that I become more and more confused. Although I agree that the diagnosis appears to be that of a volvulus or some other obstructive lesion, there are several aspects of the history which tend to indicate that the case is more medical than surgical—for example, why was there no vomiting and why in the plain X-ray film were there no distended loops of bowel to be seen and why no fluid levels? Yet he was grossly distended. I suppose one could explain this by presuming that a perforation had occurred, allowing the escape of gas and intestinal contents in the peritoneal cavity, but under these circumstances gas should be seen under the diaphragm, yet this was not found by X-ray examination. If one is to make a medical diagnosis, then the mass palpable could be regarded as being an enlarged liver from some medical cause. This could be associated with an acute gall-bladder which had ruptured, allowing the formation of a localized abscess on the right side.

Operation Findings.

DR. E. HIRST: The operation findings were as follows. A right paramedian incision was made, and on the opening of the peritoneal cavity considerable blood-stained fluid escaped. Situated on the right side of the peritoneal cavity there was a small bowel volvulus. It was composed of about two feet of small bowel, whose wall was oedematous and of firm rubbery consistency. The part of the small bowel involved was not stated. Nor was any statement made regarding any constricting bands. The gangrenous bowel was resected, and the ends of the normal bowel were closed and inserted into the mesentery. A side-to-side anastomosis was then performed. A stylized drawing shows that on the right hand side of the abdomen in the area heavily shaded there was a volvulus. It had crossed the mid-line to become palpable in the right hypochondrium. A similar case has recently been described by Mr. T. F. Rose (M. J. AUSTRALIA, December 10, 1955).

Pathological Discussion.

DR. ROSE: You have heard the comments from the various speakers, gentlemen. I think you will agree that this was a most difficult case to discuss. There have been several points raised in the discussion. Mr. Alan Sharp asked why there was no radiological evidence of this lesion. We have Dr. Marsh with us today. Dr. Marsh is acquainted with the diagnosis, and I will ask him to answer your query.

DR. H. G. MARSH: I thought about this case and other cases of intestinal obstruction in which the X-ray findings were not very helpful. The pattern, shall we say the signs, by which an X-ray diagnosis of intestinal obstruction can be made, depend upon distension of the bowel with gas. If the gas had been removed there are no distended loops. Gas can be absent if the obstruction has not been complete. That happens quite frequently in intussusception. Another reason for negative X-ray findings is such as happened the other day in a case in which there was intestinal obstruction quite soon after an operation. There were no distended loops seen on the X-ray film. A stomach tube had been in use, and a good deal of material had been sucked out from time to time. What these cases show is that a negative X-ray finding does not mean there is not intestinal obstruction. A negative X-ray finding in the absence of gastric suction probably means that there is not a very complete obstruction or that there has not been obstruction for any length of time. In this case there was the passage of blood, mucus and faeces, meaning that the obstruction in the volvulus was not complete, and therefore there were no distended loops. The distension of the abdomen was found at operation to be due mainly to fluid. This should probably have been mentioned in the X-ray report. It is possible to make a diagnosis of ascites quite readily on X-ray films.

DR. ROSE: I do not think that this case today has presented as much scope for the pathologist as others in the past, but I would like to hear some comment by members of the pathology section here. Professor Inglis, I think this is a subject in which you have been interested for some time. Would you like to say something?

PROFESSOR K. INGLIS: No thank you, sir.

DR. ROSE: One thing that struck me in reading this history was the speed with which the surgical staff—I think most of them are now retired—attacked this particular patient. It is seldom now that we see a patient with an acute emergency, particularly intestinal obstruction, attacked with such vigour and speed after admission. The art of resuscitation is one which we have become more conscious of in recent years, and we will become even more conscious of it now that we have a department of anaesthetics and resuscitation established here. I would like to ask Dr. Douglas Joseph to say something about the resuscitation of patients prior to operation.

DR. D. JOSEPH: This was an interesting case, and I hope that Dr. Greenwell will not think me presumptuous if I say something about the treatment. He knows, however, our view that it is a matter of liaison between the surgeon and the anaesthetist as to when is the optimum time for operation. A number of things come out of this history. First, from the resuscitative point of view the only figures we have are a haemoglobin value of 19.2 grammes per centum and a specific gravity of urine of 1.030, which shows on those two figures alone that the man was very dehydrated. I am very surprised that the blood pressure was 135/100. I would have thought, in view of the severe degree of dehydration, that it would have been lower. He was obviously very ill.

A number of things should have been done before he was submitted to surgical and anaesthetic assault. We would like

to know in these cases figures for plasma electrolytes, haematocrit, and carbon dioxide combining power. All these things I am sure can be done in two hours, and during this time we can start to resuscitate the patient. This is a long-range view—we have to prepare the patient for operation and also for his post-operative period. No drip was started on this patient pre-operatively, no tube was passed, and no blood was cross-matched for him, and his anesthetic was "open" ether. As Dr. Rose has said, I do not think these things could happen today. This man, just on these figures and his clinical condition, was obviously in deficit of probably four or five litres; and whilst we were waiting for these figures to come through, we should have started this patient on an infusion, probably with normal saline, and had him cross-matched because there might have been large bowel resected at operation.

It is difficult to assess such patients, particularly if they have been going for some days outside a hospital, because there one looks for the help of the pathology and biochemical departments. The greatest asset is the clinical condition of the patient, and one can fairly judge his electrolyte balance on that. Once the patient is in hospital, the question of electrolyte balance is very much easier, because his fluid loss can be charted and is the only way to be certain what has gone on previously. I do not want to go into minute detail, and only wish to say that these days the patient would not have been taken to the theatre so quickly, and it would have been a surgical-anesthetic liaison as to when to operate. Too long a delay would not be desirable, and we would be able to resuscitate him to be fit for surgery, and probably it would take three or four days to get him into a proper state of electrolyte balance after the operation.

Dr. ROSE: Have any points been raised that would bear comment? I will ask Mr. Greenwell to wind up the meeting by commenting on the discussion.

Mr. GREENWELL: I felt I should say something in respect of treatment, although much has been said already. I believe this patient was dehydrated, and I agree with Dr. Joseph wholeheartedly that not necessarily a new approach, but perhaps a more scientific one, to these electrolyte problems will benefit surgery in this hospital. There is no question that a tube should have been placed and intravenous therapy commenced pre-operatively, and it is pretty poor commentary that this was not done. I agree with the operative details. A laparotomy of this type would be performed through a right paramedian incision, and the findings would determine resection. I would be interested to know how the patient got on, Dr. Hirst?

Dr. HIRST: The patient died within an hour after the operation.

Dr. GREENWELL: I think this is probably further reason for Dr. Joseph's request that we have better liaison between surgeon and anesthetist.

Dr. ROSE: Gentlemen, we have had wide discussion on this interesting problem, and I would like to congratulate so many commentators for getting so close to the diagnosis.

Diagnosis.

Volvulus of the small bowel.

British Medical Association News.

SCIENTIFIC.

A MEETING of the New South Wales Branch of the British Medical Association was held on June 28, 1956, at the Robert H. Todd Assembly Hall, British Medical Association House, 135 Macquarie Street, Sydney. Dr. E. F. THOMSON, the President, in the chair.

Advanced Carcinoma: Treatment and Management.

Dr. E. J. B. HARDCASTLE read a paper entitled "The Management and Treatment of Advanced Carcinoma" (see page 629).

Dr. T. E. WILSON read a paper entitled "The Management and Treatment of Advanced Cancer" (see page 632).

Dr. J. CAMERON LOXTON, in opening the discussion, referred to the President's attempts to increase the attendance at Branch meetings since he had assumed office. Dr. Loxton agreed with what Dr. Thomson had said from the chair in deploring the small number of doctors who were present to discuss possibly the most important and interesting subject for any member of the medical profession. Dr. Loxton then said that he thought the question of cancer was still largely

one of publicity, affecting not only the lay public but also the members of the profession. He pointed out that often the patient with a lump in the breast who sought advice was told not to bother about it, but to go away and come back in three months; by that time it would probably have developed into something with considerably greater potential. Another patient with uterine haemorrhage might be told not to bother about it, but to come back later; when she returned, the condition would probably be inoperable. Such an attitude on the part of members of the profession should be deprecated. Dr. Loxton went on to say that Dr. Wilson had mentioned Wertheim's operation more or less in passing. Dr. Loxton said that in his opinion Wertheim's operation, apart from being one of the most difficult operations to perform, was one of the best. He referred to a meeting held on the previous night by the Royal Australasian College of Surgeons, at which figures had been provided by Dr. H. O. Lancaster to show how the treatment of cancer had improved with the various types of cancer treated. One of the types of cancer in which treatment had improved over the last fifteen to twenty years was cancer of the uterus. The death rate had fallen considerably. Dr. Wilson had mentioned exenteration procedures. Dr. Loxton said that they were no longer in the experimental stage; they had come to stay. Those members of the profession who were anxious to achieve something in the treatment of cancer must go into that work more extensively than they were doing at present. Dr. Wilson had also referred to the horrors of people with various apertures and colostomies. Dr. Loxton said that he could show him a patient who had undergone a total pevic exenteration (the case was reported in THE MEDICAL JOURNAL OF AUSTRALIA on June 23, 1956, at page 1045), and who was delighted with her colostomy. For the past nine months she had been able to live a perfectly normal life, whereas for many months before her operation she had been in intolerable pain, her life being absolute misery. Dr. Loxton said that it was much better for people to have artificial apertures and orifices than to be dead and buried. Dr. Loxton said that Brunschwig, who was the man who had the greatest experience in the world of those procedures, maintained that the operations had come to stay. In April in a personal communication he stated that he had already performed 441 such operations. His five-year survival rate in the first 100 cases was 12%. In his next series of 100 cases or so, his five-year survival rate had risen to 16%. In his first 100 cases the mortality rate was in the region of 26%; in the next 100 cases the mortality rate had also diminished proportionately. Dr. Loxton, in conclusion, emphasized that the treatment of cancer depended on attack from both ends of the scale. Early diagnosis and treatment undoubtedly gave the greatest chance of permanent cure; but the opportunity of salvaging patients in the late stages by extensive eviscerating procedures should not be overlooked.

Dr. R. V. RICKARD first asked Dr. Hardcastle whether in Sydney many patients were being treated for breast cancer on the principles laid down by McWhirter. Dr. Rickard then asked Dr. Wilson at what stage he recommended the removal of the glands draining the area of a melanoma. Cooper, of the Queensland Radium Institute, had in about 1947 sent out an instructive paper to all medical practitioners in Queensland, in which he suggested that the glands should be removed approximately three weeks after the wide removal of the initial lesion. The theory behind it was that the period gave time for the metastases, which were then in the process of migrating to the glands, to reach the glands before the latter were removed. Dr. Rickard said that it seemed rather a naïve idea; yet apparently Cooper was quoting authorities in other parts of the world.

Dr. R. B. C. STEVENSON said that it appeared that those who were trying to do something for people with cancer were very much in the dark. Dr. Hardcastle had said that amongst the forms of palliative treatment was the administration of stilboestrol and androgens; then Dr. Wilson had said that he would remove the ovaries and adrenals, which would dry up the source of the oestrogens and the androgens. Those two remarks seemed to show how little was known about the subject. Dr. Hardcastle had shown interesting X-ray films, and it was obvious that he had been able to relieve many of his sufferers. However, the thing to aim at was to be able to say in advance what type of cancer would be removed by what type of treatment—whether one was better treated by irradiation and another by surgery. Dr. Stevenson thought that it should not be impossible for the cytologists and pathologists to concentrate on tissue cultures, cytological cultures and cytological studies and be able to tell in advance which would be the best form of treatment for any particular patient with a cancerous tumour. In a small way at the Women's Hospital, Crown

Street, they were working along the lines of Graham's technique; all subjects with pelvic cancer were subjected to sensitization response tests. If the result was 10% or greater, they were treated with radium. After the first radium treatment, if the result of the first radiation response test was 70% or over, they received a second radium treatment, which was probably followed by deep X-ray therapy later on. If, on the other hand, their original sensitization response was under 10%, they were usually treated by radical surgery without any prior radiation treatment. If their response to the first radium treatment was under 70%, they were given no more radium or subsequent deep X-ray therapy, but were subjected to radical operation. Dr. Stevenson said that it seemed to him that that method of dealing with patients was getting down to a more scientific basis, and he thought it might be able to be used, not only for patients with pelvic cancers, but for those with other forms. Dr. Stevenson also thought that when super-voltage machines were available in Australia, the good work of Dr. Hardcastle and his colleagues would be enhanced. He looked forward to better results in the future.

DR. R. KENT BURNETT had a question for Dr. Wilson about the "second look" procedures. Dr. Burnett thought they were an important improvement, and that most sufferers from cancer would welcome a second laparotomy. He asked Dr. Wilson at what stage he was accustomed to carrying out that procedure, and on what he based his decision as to the time to operate again.

DR. C. F. A. DE MONCHAUX said that he wished to stress the point made by Dr. Stevenson: in the treatment of advanced malignant disease, as in the treatment of any other stage of malignant disease, one of the most important things was the cooperation between surgeon and radiotherapist. Dr. de Monchaux said that it was borne in on him more and more every year that much time and energy would be saved and better results would be obtained if a definite programme of consultation and cooperation was arranged between the surgeon and the radiotherapist. The only practical means of obtaining that was by the periodical and regular holding of consultation clinics, especially in the big hospitals. Dr. de Monchaux went on to refer to Dr. Hardcastle's question as to what was advanced carcinoma or advanced neoplasia. Dr. de Monchaux suggested that the criterion might be made the involvement of regional lymph nodes, whether macroscopically or microscopically detected. In his experience such involvement always meant advanced malignant disease. Once that great protective barrier of the body, the reticulo-endothelial system (in that case represented by the regional lymph nodes) was involved, then the neoplastic condition was not only well established but advanced, and in nearly all cases the patient would die from malignant disease. On the right side of the fence when lymph-node involvement was absent, there was a good chance of saving a relatively high proportion of patients treated either by radiotherapy or by surgery. Before involvement of the lymph nodes, the condition could be regarded as early or intermediate. Immediately stemming from that was the idea of the much criticized Professor McWhirter; Dr. de Monchaux considered that he had done magnificent work in evolving and submitting his revolutionary theory, especially in relation to carcinoma of the breast. His argument, which Dr. de Monchaux thought unanswerable, was that in any case of carcinoma of the breast, the regional lymph nodes—notably the axillary lymph nodes—were involved, or they were not. If they were not involved, there was no need to perform a radical mastectomy. If they were involved, it was too late. In conclusion, Dr. de Monchaux said that in his opinion the field of treatment before involvement of the regional lymph nodes was largely and often primarily the field of the surgeon; after involvement of the lymph nodes, the treatment was largely and primarily the field of the radiotherapist.

DR. M. S. ALEXANDER referred to terminal carcinoma. He said that he agreed with the advice Dr. Wilson had given with regard to the drugs to be used. Dr. Alexander said that it was his clinical experience in hospital and general practice over the last ten years that there was a tendency for general practitioners to start using parenteral therapy at far too early a stage, when the patient had left the hands of the surgeon or the radiotherapist. Dr. Alexander believed that some practitioners had over-sensitive nervous systems, and they bore the pain of the patient along with the relatives rather less well than did the patients themselves. The starting of parenteral therapy at an early stage had some curious results. Dr. Alexander was one of those who had the rather doubtful privilege of sitting on a committee of inquiry on which they were at times called upon to look at what other doctors were doing. If it was found that a

practitioner was attending a patient four times a day for thirty days in a thirty-day month—120 times in a month—at a cost to the Government of 12s. a time plus drugs—roughly £70 or so in a month—it made one wonder whether that doctor had not in fact begun parenteral therapy at too early a stage, especially when in many cases such things seemed to be going on not only for a month or two, but even years. Dr. Alexander from his own experience believed that there was no necessity to start parenteral therapy at too early a stage. He thought that it was important that practitioners should train their young colleagues in that attitude. It had been his experience that injections of morphine and pethidine and so on, in the vast majority of cases, could be left till the last few weeks of life. Even such old-fashioned things as morphine suppositories had their place in the treatment of such patients. Dr. Alexander, in conclusion, said that they should all take notice of Dr. Wilson's advice with regard to particular drugs.

Dr. Thomson, from the chair, asked Dr. Hardcastle a question. Dr. Thomson asked the precise part that the cobalt beam would play in the treatment of advanced carcinoma, and also what were the relative merits of the cobalt beam in relation to other forms of super-voltage X-ray therapy. If the cobalt beam was not superior to other forms of super-voltage X-ray therapy, why did the radiotherapists frown on super-voltage X-ray therapy when it had been recommended in Australia four years earlier?

Dr. Hardcastle, in reply to the question whether many patients in Sydney were being treated by McWhirter's technique, said that the answer was in the negative. McWhirter had formulated a policy of treatment, and he or one of his fellow radiotherapists examined every patient with cancer of the breast in the south-east of Scotland. He had a large department with a highly trained radiotherapeutic staff, who were able to supervise the patients' treatment. When one advocated simple mastectomy, one must have available adequate radiotherapy. Dr. Hardcastle said that he was not trying to decry radiotherapy in Sydney; but there were difficulties—shortage of staff, shortage of beds. It was believed that at present the operation of radical mastectomy should be carried out. It would certainly be interesting to carry out McWhirter's technique in a series of patients; but, of course, thousands of patients would be required as McWhirter had at the present time—possibly over 200—and it took a considerable period to assess the results. Dr. Hardcastle said that in his opinion, if radical mastectomy was carried out, the patient in the early stages had a better chance. McWhirter felt that every patient should have the same chance, and that was why he had advocated simple mastectomy. Dr. Hardcastle felt certain that in stages I and II, radical mastectomy offered the patient a far better chance of survival in Sydney at present. In reply to the question about the use of oestrogens, Dr. Hardcastle said that he could not see that his remarks and those of Dr. Wilson contradicted each other. The subject under discussion, advanced carcinoma, was rather general, and it had been necessary to skip over many points. It was believed that oestrogens should be used in the treatment of people aged over sixty years who had generalized breast carcinoma. By generalized carcinoma was meant soft tissue recurrence, lung metastases, and in some cases osseous metastases. In about one-third of such cases one could expect some arrest of the disease. Dr. Stevenson had spoken about cytology and the interesting work being done at the Women's Hospital, Crown Street. To go back again to McWhirter, it had to be remembered that one had to have a policy of treatment. In the hospitals of England there was a policy—either Wertheim's procedure or irradiation. Dr. Hardcastle thought that irradiation gave all the patients a chance; he thought that Wertheim's hysterectomy gave a certain percentage, those in the early stages, the better chance. The results from the Radiumhemmet by radium and deep X-ray therapy were as yet the best in the world. At the King George V Hospital (Royal Prince Alfred Hospital) the figures for Wertheim's hysterectomy (stages I and II) were undoubtedly very good; but they were no better than the figures for radiotherapy. When it was realized that out of all patients (some thousands) 40% of five-year survivals were obtained, that was very good. However, that figure could be improved, and the use of cytology as advocated by Dr. Stevenson was a great advance. Dr. Hardcastle said that what was being done was that the patients were given radium treatment and then serial biopsies were carried out to see whether the tumour was responding. If it was not, then Wertheim's hysterectomy was being performed, and they were hoping for some results in the future to show some improvement in the figures. Another thing that had to be realized was that there were degrees of malignancy in carcinomata. Some were relatively slow-growing and offered

a physician a good chance. Others, no matter what was done, would kill the patient rapidly, because their degree of malignancy was great. They metastasized rapidly. He had even seen some carcinomata of the cervix do that. Just because a lump in the breast had been present for six months, the patient did not necessarily have less chance of cure than the patient who presented with a lump in the breast which had been present for only a few weeks. It might be that the first of the two patients had a better chance of cure than the other with so-called earlier disease. In reply to Dr. Thomson's question on super-voltage therapy, Dr. Hardcastle said that he did not realize that super-voltage therapy had been knocked back in Sydney by the radiotherapists four years earlier. He had recently read an article in *The Journal of the Faculty of Radiologists*, in which Bloomfield had reviewed five years of use of super-voltage therapy. His conclusions could be stated briefly. The method offered very little in most carcinomata; it had been of help in relieving advanced carcinoma of the cervix; in advanced carcinoma of the bladder the figures were definitely improving; in carcinomata around the mouth, tonsil, nose and antrum his impressions were that the figures had improved, but he was not sure. However, super-voltage therapy was not the be-all and end-all of radiotherapy; it was an added weapon for use. Referring to the benefits of super-voltage therapy, Dr. Hardcastle pointed out that the biological effects of radiation were the same whether it was super-voltage therapy or ordinary deep X-ray therapy. However, super-voltage therapy produced less skin reaction; if it was used to treat a patient with a deep-seated tumour, it did not produce the so-called severe burns. It was also much easier with super-voltage therapy to deliver an adequate dose into the tumour. Also, its total body energy absorption was far less—the patient was not so distressed by the treatment, and did not become ill from it. Thirdly, in the lesions round bone, especially the floor of the mouth, the energy absorption of bone and tissue was about the same, so there was far less risk of bone necrosis. At the present time there were not many cases of atrophic necrosis of the head of the femur, though one or two had occurred recently; but Dr. Hardcastle thought it would not occur if carcinoma of the cervix was first treated with radium and then by super-voltage radiation. He thought that super-voltage therapy was a complete necessity in any large city. With regard to cobalt beam units and the so-called 4,000,000 volt linear accelerator, Dr. Hardcastle said that he thought the cobalt beam unit was the more satisfactory only in so far as maintenance was concerned. With the linear accelerator one had a complicated electrical unit, and with so much equipment it tended to go wrong, so that a maintenance staff was needed. With the cobalt beam there were almost no electrical circuits but only a moving head. The only difficulty was that the cobalt had a life of five years, and had to be replaced probably in two or three years. The protection problems were somewhat less with cobalt beam—less concrete was required. Its usefulness was exactly the same as that of a 4,000,000 volt linear accelerator. They had advocated the cobalt beam for Australia, because ultimately it would be far cheaper to run.

Dr. Wilson, in reply to Dr. Loxton, said that he agreed with what he had said about the lack of publicity given to cancer cases and the cures that were achieved. It seemed to him that the cure of a patient with cancer was just as important as the cure of a patient with some congenital cardiac lesion, but apparently that was not so as far as the newspapers were concerned. In reply to the question about Wertheim's operation, Dr. Wilson said that he had pointed out that it had been in use for decades, but there was still considerable controversy about its place in the treatment of carcinoma of the uterus. Referring to the statistics reported by Dr. Lancaster on the previous evening, Dr. Wilson said that they showed that the figures for carcinoma of the uterus, both cervix and body together, had improved somewhat over the past fifty years. Those were on the basis of deaths per million of population at various ages. The figures for other cancers, for example, carcinoma of the ovary and carcinoma of the stomach, had also improved. Dr. Wilson did not think that the surgeons could claim that the improvement in the figures for carcinoma of the stomach in comparison with those of three decades previously was due to their treatment. Their saving of a patient with carcinoma of the stomach was very rare. The figures for the other cancers, especially carcinoma of the lung, in spite of treatment had deteriorated considerably. Dr. Wilson said that he was afraid he must have given a wrong impression when he spoke of the horrors of the various orifices that the surgeon made artificially. The point he had been trying to make was that a wet colostomy was

no more fearsome than an ileostomy. The establishment of an ileostomy was a procedure advocated by most surgeons in the treatment of intractable ulcerative colitis. That being so, he did not see why a wet colostomy should not be accepted by the patient under certain circumstances. In reply to the question dealing with the time when glands in the axilla, groin *et cetera* should be removed in cases of malignant melanoma, Dr. Wilson said that when an unexpected report of malignant melanoma was received, he removed the regional glands a week after the removal of the primary tumour. However, in every case in which he had found the glands to be involved, the patient had died. Meyer had given his results over a period of forty years, in that time he had carried out that treatment in about a dozen such cases in which the glands were found to be involved on microscopic examination, and yet the patient was apparently cured. Referring to the use of hormones in the treatment of cancer, Dr. Wilson said that it was still only experimental. In the treatment of carcinoma of the breast, oestrogen was usually given to older patients five or ten years after the menopause who had intractable mammary cancer, and androgens were given to the younger patients. Neither oestrogen nor androgen was certain in the effect it would produce, but in about half the cases it produced palliation. Oophorectomy had been recommended for patients at all ages with advanced mammary carcinoma. Castration was used in the treatment of men with carcinoma of the prostate or of the breast. Adrenalectomy was still in the experimental stages; even so, it seemed that a definite place for adrenalectomy was when the patient had developed intractable pain, due to bone metastases from mammary carcinoma. In reply to the question about the time for a "second look" procedure, Dr. Wilson said that in general he had used it for people who had asked whether something more could not be done to make sure that the growth would not recur; he had used it in about 15 cases. It was performed only in cases in which one thought that all malignant tissue had been removed at the first operation. He thought that it should be "pushed" in cases of carcinoma of the stomach. If the patient had carcinoma of the stomach, limited lymph-gland involvement found at the primary operation and no distant metastases, and asked for something more to be done, then in four to six months one should have a second look. Dr. Wilson said that he agreed with Dr. de Monchaux that regional lymph-gland involvement indicated advanced malignant disease. However, as most of his surgery was concerned with the gastro-intestinal tract, he could not agree with Dr. de Monchaux that the field of the radiotherapist comprised the patients whose regional lymph glands were involved. Dr. Wilson then referred to the patients mentioned by Dr. Alexander, who had left the hands of the surgeon and the radiotherapist. Dr. Wilson thought that no patient should reach that stage; the management by the surgeon or the radiotherapist should be continued, either directly or through the general practitioner, until the patient died.

Dr. Thomson, from the chair, said that perhaps the small attendance was due to the fact that there had been a meeting on the previous evening under the auspices of the Royal Australasian College of Surgeons on "What Do We Achieve by the Surgical Treatment of Cancer?". However, he had been fairly reliably informed that even if the two audiences had been combined, the Robert H. Todd Assembly Hall would not have been filled. It seemed to him extraordinary that, at a time when research into cancer in New South Wales was an all-important matter, no representatives of the State Cancer Research Council or the State Research Committee were present to give the benefit of their wide experience. Dr. Thomson said that he had been interested to hear the remarks about cytology in cancer. It so happened that some time previously application had been made by the Royal Prince Alfred Hospital to the State Cancer Research Committee for a grant of £6000 to establish a cytological unit to study cytology in relation to all forms of cancer. That sum of money would have employed three medical pathologists at a salary of £1350 each, and there would have been enough money to buy three microscopes. The committee had turned down the project on the grounds that it was not a research project, but had to do with the routine management of cancer. It suggested that the application should be made to the State Cancer Council. The application was made and turned down on the grounds that the Council had no money. Dr. Thomson said that, in view of that incident, it was interesting that he had the previous day received from the New York Academy of Science a volume of some 560 pages dealing solely with the cytology of cancer. Dr. Thomson, in conclusion, thanked the speakers for their papers, and those who had joined in the discussion.

Out of the Past.

In this column will be published from time to time extracts, taken from medical journals, newspapers, official and historical records, diaries and so on, dealing with events connected with the early medical history of Australia.

COURT MARTIAL OF D'ARCY WENTWORTH.¹

[Governor Bligh to the Right Honourable William Windham.]

From "Historical Records of Australia".

Sydney,
31st October, 1807.

Sir,
The extreme misconduct of Mr. D'arcy Wentworth one of the Assistant Surgeons, in applying convicts to private labour whom he received into the Hospital at Parramatta as sick men rendered it absolutely necessary for me to suspend him from his Situation on 25th July last until His Majesty's Pleasure is known thereon.

Instead of the Hospital being an Asylum for sick men and as soon as they recovered to be returned to Government labour or to the poor Settlers from whom they came it has been a practice to allow them to remain virtualised as Hospital Patients requiring care, applying their use to private advantage. In my Journeys through the Country the settlers have stated to me in affecting terms, that the men allowed them by Government constantly framed excuses and got into the Hospital: that after feeding them for fourteen days (at the expiration of which time the expence of victualling falls on the Government) conformable to the Regulation, they have not been returned to them upon recovery by which a heavy loss was sustained on their part, besides being worn out with fatigue in endeavouring to cultivate their ground for support and which appears to me to have been the case.

I have &c.,
WM. BLIGH.

Correspondence.

PUBLIC RELATIONS FUND OF THE NEW SOUTH WALES BRANCH OF THE BRITISH MEDICAL ASSOCIATION.

Sir: The admirable letter from Dr. Shineberg in your issue of September 15—delayed in reaching me presumably because of the postal strike—prompts me to mention a similar circumstance where it seems possible that doctors who did not make any initial contribution may benefit equally with those who did. It concerns the public relations fund of the New South Wales Branch of the British Medical Association. There are many excellent reasons for pursuing this project further. Would it not be more equitable, however, to make it a general charge on all members?

Yours, etc.,
VOLNEY BULTEAU.
143 Macquarie Street,
Sydney,
October 2, 1956.

THE WONDER DRUGS OF PSYCHIATRY.

Sir: I am at one with Dr. Godfrey Harris (M. J. AUSTRALIA, September 29, 1956) in that coining words from old Greek is often a cloak for ignorance. But I cannot share with him the approach of Lady Macbeth's doctor to psychiatry. Should we revert to the days before malaria therapy, when a tenth of the insane rotted to bits mentally and physically? To the pre-"Cardiazol" era when a lot more doomed citizens cut short their once promising lives which had turned to an endless nightmare too horrible to tolerate? Were lunatics better served before insulin and electrotherapies, when attendants hung up coats when they signed on, intervened in

fight all day in "refractory" wards, and donned their coats again on leaving? In Lady Macbeth's day "asylum" would have been a cynical euphemism for the zoos which housed some of her kind.

I do not pretend that new drugs have cured or explained anything. But no palliative treatment can be condemned on the basis of a hypothetically prohibitive future cost because in their trial phases a small percentage of patients need extravagant doses. This defeatist approach has already unduly delayed free availability of oral penicillin in adequate doses for prevention of rheumatic fever, which is just as ignorant palliation as the psychiatry Dr. Harris nihilizes.

Yours, etc.,
DOUGLAS EVERINGHAM.
P.O. Box 328,
Rockhampton,
Queensland,
October 2, 1956.

SUMMER CAMP FOR DIABETIC CHILDREN.

Sir: I would be grateful if you would again publicize the annual summer camp for diabetic children, which is to be held at the Fairbridge Farms, Molong, New South Wales, for two weeks from January 12, 1957. Any diabetic child under the age of thirteen years is eligible for the camp, which provides a healthy country holiday under skilled dietetic supervision, at a small cost. Practitioners with child diabetics under their care, who they believe would enjoy and benefit from the camp, should supply parents with a letter setting out the child's diabetic requirements, and a certificate of freedom from any infectious complaint, to accompany their application to Miss A. Allen, c/o Dietitian's Office, Royal North Shore Hospital, St. Leonards, Sydney.

Yours, etc.,
KEMPSON MADDOX,
President, Association for Summer
Camps for Diabetic Children, New
South Wales.

141 Macquarie Street,
Sydney,
October 8, 1956.

Obituary.

HERBERT JOHN GRAY.

We are indebted to Dr. B. C. Cohen and Dr. H. H. Stewart for the following tribute to the late Dr. H. J. Gray.

With the recent death of Herbert John Gray, the medical profession and the community generally have lost another personality brought up in the old tradition of service to his fellow men.

Dr. Gray was born in Carlton in 1884, within sight of the University of Melbourne, where he was to graduate twenty-three years later. At school he was most studious. He was unable to become proficient at sports on account of defective vision, which necessitated the wearing of glasses and earned for him the sobriquet of "Specs". He came to the West soon after graduating, and became medical superintendent of the Children's Hospital, now Princess Margaret Hospital. He subsequently carried on a general practice in North Perth.

Dr. Gray early came under the influence of the late Dr. Frank Andrew, a dramatic and forceful personality, who later had a large specialist practice in Melbourne, and it was from him that he acquired his interest in oto-rhino-laryngology, in which specialty he became so proficient that he was acknowledged one of our leaders in this field without ever having the benefit of overseas experience. He was always a student and a careful reader.

During the 1914-1918 war he was appointed to a specialist position at Number 8 Australian General Hospital at Fremantle, and in 1924 was appointed surgeon to the Ear, Nose and Throat Department at the Royal Perth Hospital, a position which he held for twenty-five years until he retired in 1941. During this time he taught the rudiments of his specialty to a succession of resident medical officers and general practitioners who attended his clinic, and to many of them the finer points of his art, which led to their ultimately taking up the specialty themselves. He also enjoyed lecturing to nurses for many years. More than this, he manifested the keenest interest in every branch of

¹From the original in the Mitchell Library, Sydney.

medicine and surgery which even remotely touched on his own field, and his probing mind was a stimulus to all with whom he came in contact. The superficial answer never satisfied him, and it was always a case of getting back to fundamental principles.

His character was forthright and honest, and beneath his apparent brusqueness, which often intimidated the new resident medical officer or assistant, there was a kindness, consideration, and a desire to help, which soon became apparent. Laziness or inefficiency he could not tolerate.

He became a member of the Council of the Western Australian Branch of the British Medical Association and was President in 1931, an office which he held with distinction. During his years of active work with this Association he was one of the founders of the Medical Benevolent Fund and the Medical Defence Association, and with Dr. J. J. Holland, another distinguished consultant of the Royal Perth Hospital, and the help of Mr. T. A. Davy, a member of Parliament, he was responsible for the passage of the

His active interest in all matters pertaining to the profession continued unabated and undimmed, and he departed from his labours as he would have wished, in full harness, leaving an example of devoted work for his patients and his profession of which any one of us might be proud. He was a man of great integrity (in all his actions), maintaining the highest ideals—one who well deserves the epitaph: "*Integer vitae acclerisque purus.*"

ARTHUR E. GUEDEL.

A RECENT Newsletter of the American Society of Anesthesiologists announces the death of Arthur E. Guedel, of Los Angeles, one of the world's most eminent anaesthetists. He had lived in retirement for several years, and had long been ailing.

The period 1920-1940 was one of rapid progress in anaesthetics on the North American continent. Under such leaders as E. I. McKesson, R. M. Waters, Guedel himself and J. S. Lundy, anaesthetics became firmly based upon physiology and pharmacology, and thus developed from a technique into a science. Of Guedel's many contributions, four have combined to make his name familiar to every anaesthetist. In 1934 he described a technique which was to evolve into the "controlled respiration" of today. As he originally described it, it was "control-by-depth-of-anaesthesia" rather than "control-by-acapnia", but its subsequent development by Waters and Nosworthy provided anaesthetists with a technique fundamental to thoracic operations. Secondly, Guedel's pharyngeal "airway" is still in daily use in operating theatres. Thirdly, his book "Inhalation Anaesthesia" (1937, 1951) is still perhaps the best of all manuals of primary training. Finally, his chart of the "signs" of anaesthesia (1920) is part of the basic equipment of anaesthetists all over the world. Beyond all this, Guedel was a source of inspiration to all associated with him and a man greatly beloved.

WILLIAM GEORGE HENRY CUSCADEN.

THE following appreciation of the late William George Henry Cuscaden has been prepared by Dr. Kelvin Churches and Dr. George Simpson.

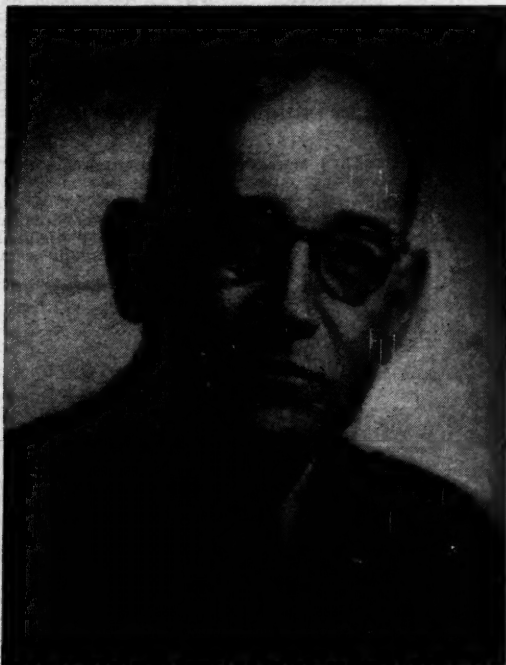
Dr. William George Henry Cuscaden, M.D. (Melb.), F.R.C.S. (Edin.), F.R.A.C.S., whose sudden death occurred on July 1, 1956, will be remembered for his long association with The Royal Women's Hospital, Melbourne.

His appointment to the honorary medical staff in 1914 coincided with the retirement of his father, Sir George Cuscaden, and, between them, the Cuscadens served the institution for fifty-one years, beating by two years a parallel record of service to the same institution given by Dr. G. H. Fetherston and his son, Dr. R. H. Fetherston.

Born in 1887, the only son of Major-General Sir George and Lady Cuscaden, Dr. W. G. H. Cuscaden was educated at Scotch College, Melbourne, and graduated in medicine with final honours in 1908 at the University of Melbourne. He carried on a general practice at Preston from 1911 and later in South Melbourne. In 1923-1924 he did post-graduate work in Vienna and Edinburgh, and, on his return to Melbourne after that, he practised solely as a specialist in gynaecology.

To the present members of the medical staff of The Royal Women's Hospital, "Cus" was always one of the most colourful personalities of the older generation. With a record of thirty-three years' service to the hospital, his reminiscences of the earlier days of the hospital, and of medical practice, were a never-ending source of interest and delight to his juniors.

In an era when the practice of gynaecology had not gained the repute in which it is held today, "Cus" was noted as a teacher of conservatism and avoidance of "meddlesome gynaecology". When the indication for surgery existed, he was equally outstanding for his dexterity and speed of operating. However, it was his pioneering and vast experience of radiotherapy at The Royal Women's Hospital that brought him fame. He originated many techniques in the management of cancer, including several ingenious vaginal and uterine applicators, and developed a method of direct cervical inspection that was very useful in early diagnosis. He was the first to use radium and radon at the hospital (1920) in the treatment of cancer and other gynaecological conditions.



Anatomy Act; this one can say without hesitation was the first practical step taken towards the founding of the medical school which is so soon to open new vistas for our hospital. This made possible the establishment of the dental faculty and later the course in physiotherapy.

As a result of this Act the first anatomy school was opened in 1933 in the basement of the old casualty block of the Royal Perth Hospital, and remained there for many years, its first curator being the then medical superintendent, Dr. Hector Stewart.

With the founding of the Royal Australasian College of Surgeons, Dr. Gray, with other senior members of the honorary staff, became one of its foundation members, and upheld its aims and objects in an exemplary manner.

In 1929, in conjunction with Dr. Donald Smith, Dr. Gray presented a paper on "The Value of Mastoid Skiagraphy" to the Australasian Medical Congress (British Medical Association). This was the first attempt in this continent at correlating clinical and radiological manifestations of mastoid disease.

One of his main interests outside his profession was the processes of law. This appealed to his keen and analytical mind, and he was a prime mover in the meetings of the combined medical and legal societies in which he took great interest and delight. He became chairman of the Medical Services Committee of Inquiry in 1954, on the death of Dr. H. Lucraft.

His wide experience added greatly to the knowledge of the effects of radiation, and, as a result, the correct place of radiation in the treatment of cancer was established. Though he remained an advocate of radiation in the treatment of uterine cancer, the part he played in the development of the present radio-surgical technique must be remembered. After he had reached retiring age, he was asked to remain on the staff to direct radium treatment until the radio-surgical unit was organized.

He was chairman of the Women's Hospital honorary medical staff during the difficult war years, when the essential function of the hospital had to be carried on with a depleted and restless staff. For his juniors he always had a friendly smile, a word of encouragement and a helping hand to show how things were done. Colleagues could always expect friendly criticism and stimulating queries in medical discussions.

On his retirement in 1947, he still maintained a lively interest in the Women's Hospital, and it is sad to think that he died on the eve of the centenary celebrations, which he would have enjoyed so much and which his presence would have enlivened.

He had many interests beside his medical work, and was widely known in business circles in the city. The lovely home at Lower Plenty which he built was the scene of much delightful hospitality. His loss in that district, which he helped to develop, is keenly felt.

No portrait of Dr. Cuscaden can be found, but his many friends need no picture to remind them of his cheerful smile and his young, carefree appearance. In his private life, he endured a succession of misfortunes with a nobility that was an inspiration to all who knew him; in his later years he found, with his young family, the peace and happiness which he merited. To his widow and children there is extended the sincere sympathy of all who had the good fortune to know and serve with him.

DR. R. KAYE SCOTT writes as follows:

I came to know the late Dr. W. G. Cuscaden during the early years of my apprenticeship to the specialty of radiotherapy, which were spent at the Royal Melbourne Hospital. At that time Dr. Cuscaden was honorary gynaecologist at the Women's Hospital, now the Royal Women's Hospital, and by consent of the staff he had been entrusted with the care of their patients needing radium treatment. The X-ray therapy department was under the control of Dr. Colin Macdonald.

In those days the practice of radium and radon therapy had received a great impetus, as the Commonwealth had purchased a radium stock valued at £100,000, which had been distributed among the major hospitals, and had established the radon plant at the Commonwealth X-Ray and Radium Laboratory in the University of Melbourne. To assist the various specialists using the newly available radium and radon, the Commonwealth had brought to Australia Dr. A. Burrows, previously of the Manchester Radium Institute. Annual cancer congresses were arranged at Canberra for those interested in the attack on the cancer problem by radiation, and encouragement was given to the younger radiotherapists to visit departments in the various hospitals.

Cuscaden took a very active interest in this radiation work, and for many years carried out all the radium and radon therapy at the Women's Hospital. He welcomed visitors to his department, and was a great personality at cancer congresses, where radiation in its relation to gynaecology was featured. He had graduated into specialist practice through general practice in one of the poorer suburbs, and had thus gained an amazing fund of anecdote and a sympathetic understanding of human nature.

His particular knowledge of his own specialty made him dissatisfied with many of the standard methods of gynaecological radium therapy of the day, and he set out to improve and perfect new applicators of his own design. To these problems he brought an inquiring and scientific approach, and he tried to reconcile problems of radiation tolerance of normal tissues with adequate dosage to tumour-bearing areas, and to fit the physical dose distributions from his applicators to the anatomy of the regions concerned. With the help of the physicists of the Commonwealth X-Ray and Radium Laboratory, much useful work in the radon treatment of carcinoma of the cervix and uterine body was undertaken and several papers were published. The Cuscaden applicator is a most useful piece of apparatus for radon therapy to the cervix, and no better prosthesis has been designed for the type of case in which it is suitable.

A day at the Radium Clinic with Cuscaden could never be forgotten. His manoeuvres and his dexterity with common gynaecological instruments never ceased to amaze one. His

teachings were fully illustrated with case histories and anecdote to drive home his points; he had no respect for the dangers of radiation, and caused consternation to those of us of the younger generation who had been taught the necessity for radiation protective measures for the safety of ourselves and the staff.

Cuscaden retired from the gynaecological staff of the Royal Melbourne Hospital because of the time effluxion of his appointment, and lived to see much progress in the application of radiotherapy to gynaecological cancer which followed the work of the major schools of Paris, Stockholm and Manchester. Cuscaden must be regarded as one of the pioneers of gynaecological radiation therapy in this country, and he must be given credit for improving the existing technical standards of his day.

After his retirement from active gynaecological practice he undertook insurance work. The loss of his son soon after his graduation from the Melbourne Medical School was a great blow to him, and in latter years he lived quietly in the outskirts of Melbourne. He was in his usual health a short time before his sudden death, the news of which came as a shock to his many friends. But for those privileged to have known him, memories of the man and his personality will long remain.

CHARLES BURGOWNE HUDSON.

DR. HUGH BARRY has sent the following appreciation of the late Dr. Charles Burgowne Hudson.

Dr. Charles Burgowne Hudson died suddenly on August 15, 1956, at the age of thirty-nine. He was honorary assistant physician to Sydney Hospital, honorary physician to the Hornsby and District Hospital, and already estab-



lished in consultant practice. In his short life he has left behind him a remarkable record of work, service and achievement.

Like his respected family, Charles set himself high standards from his early days at school. He had a fine physique and excelled in athletics at "Shore". He also played a strong game of tennis and this remained one of his chief recreations. Both at school and at the university his academic work was of a high standard. He graduated in 1940, gaining the Clayton Memorial Prize for Medicine and Clinical Medicine, and became a resident medical officer at Sydney Hospital. He left after one year to join the medical service of the Royal Australian Air Force, in which he served

for four and a half years. At this time he married Joscelyn Basil Jones and was greatly helped by her support in all his subsequent work. While in the service of the Royal Australian Air Force he lectured to many groups on chemical warfare and blood transfusion. The latter was a particular interest to him, and he published a short but valuable paper on this subject in this journal in 1943. The following year he gained his membership of The Royal Australasian College of Physicians, and shortly after his demobilization he was elected to the honorary staff of Sydney Hospital.

After the war he settled at Wahroonga and built up a large general practice. At the same time he continued his honorary work at Sydney and Hornsby Hospitals and played his full part in hospital affairs; for example, he had been chairman of the honorary medical staff at Hornsby Hospital. His reputation as a physician steadily grew, and when recently he left Wahroonga, bought a new home in Killara and confined his work to his speciality in Macquarie Street, his future was assured. He was denied the major part of this life for which he had prepared so carefully. He will be best remembered for his work at Wahroonga during the last ten years. At his service there the overflowing church of Saint Andrew paid a sad but sincere tribute to the high esteem in which he was held by relatives, friends, colleagues, nurses and patients alike.

The news of his death stunned his friends, for very few knew that his health was affected and he himself made no mention of it. It came like a dispatch in wartime when fine young men are struck down with their lives full of promise. Like them, Charles will be missed for his personal qualities, but we shall never know the full credit he could have brought to Sydney Hospital, his profession and this city had he been spared for a normal lifetime. He left a widow and a young family of three.

Post-Graduate Work.

THE POST-GRADUATE COMMITTEE IN MEDICINE IN THE UNIVERSITY OF SYDNEY.

Annual Subscription Course.

DR. RALPH B. CLOWARD, M.D., F.A.C.S., Neurosurgeon to the Queen's Hospital and the Tripler Veterans' Hospital, Honolulu, will visit Sydney from November 11 to 16, 1956, and will give the following lectures:

Wednesday, November 14, 12 noon: "The Whip Lash Injury and its Relation to Cervical Disc Pathology", Board Room, Sydney Hospital.

Thursday, November 15, 8.15 p.m.: "Discography in the Diagnosis of Lumbar Disc Lesions and the Treatment of Low Back Pain by Vertebral Body Fusion", Stawell Hall, 145 Macquarie Street, Sydney.

Friday, November 16, 1.15 p.m.: "Surgical Treatment of Involuntary Movements and Parkinson's Disease (the Cooper Operation)", Scot Skirving Lecture Theatre, Royal Prince Alfred Hospital, Camperdown.

UNITED STATES EDUCATIONAL FOUNDATION IN AUSTRALIA.

Grants to Research Scholars and Visiting Lecturers.

The Government of the United States of America has allocated funds under the *United States Information and Educational Exchange Act of 1948* (Smith-Mundt Act) for the purpose of providing supplementary dollar aid to Australian research scholars and lecturers wishing to engage in advanced research or lecturing at American universities or other approved institutions of higher learning during the academic year 1957-1958. These opportunities are offered in conjunction with United States Government Travel Grants under the Fulbright Act, and intending applicants will be considered for both a Fulbright Travel Grant and a supplementary dollar award under the Smith-Mundt Act. The awards will be made by the Department of State and the Board of Foreign Scholarships on the recommendation of the American Embassy, the United States Educational Foundation and the Conference Board of Associated Research Councils.

Benefits.—The benefits are as follows: (i) Supplementary dollar assistance under the Smith-Mundt Act. An allowance

of \$300 per month will be provided for a period of between three and ten months, depending upon the amount of other dollar assistance available to the grantee. (ii) Travel grant under the Fulbright Act. Travel grants will cover the cost of return transportation from the grantee's home town in Australia to the place of lecturing or research in the United States, together with a small per-diem allowance while he is travelling outside the continents of North America and Australia.

Conditions of Eligibility.—The conditions of eligibility are as follows: (a) Applicants must be Australian citizens of good health, character and personality. (b) They should have demonstrated academic competence in their field of specialization and should offer a project suitable to the objectives of the Educational Exchange programme. Candidates should not be undertaking work for a higher degree at an American university. (c) Applicants should have established or be negotiating to establish institutional connexion in the United States, but, in cases of special merit, it may be possible for this connexion to be arranged on the applicant's behalf. (d) It is necessary that applicants show the need for supplementary United States dollar assistance. (e) The minimum stay in the United States under the awards will be three months, but, other things being equal, preference will be given to candidates who propose to remain for a longer period, preferably an academic year.

Projects.—It is expected that candidates will undertake projects which will entail their spending at least two-thirds of their stay in the United States at the institution sponsoring their research or lecturing programme. Up to one-third of a grantee's time may, if necessary, be used to visit other institutions, provided that it is clearly established that such supplementary visiting bears a direct relationship to the main project and is essential to its satisfactory completion. The Department of State is unable to sponsor programmes in which the candidate plans merely to move from place to place making a cursory survey of various points of interest.

Category Qualifications.—There are two categories: (i) Visiting lecturers. Grants in this category will be confined to those who have received an invitation to lecture at an American university or college or at some other approved institution of higher learning in the United States. (ii) Research scholars. Applicants should already have achieved some professional standing. It is expected that candidates will already hold a degree at the doctorate level and will have had a minimum of five years' post-graduate research experience. Applicants with lesser academic qualifications are usually considered in the student category, while those enrolling for higher degrees at American universities are automatically regarded as post-graduate students irrespective of their academic qualifications and research experience.

Number of Awards.—There will be two full grants for the 1957-1958 academic year.

Applications.—Forms for application may be obtained from the United States Educational Foundation in Australia, Box 89, G.P.O., Canberra, A.C.T. Applications close with the Foundation on December 31, 1956, and it is regretted that applications received after this date cannot be given consideration. They are first reviewed by the American Embassy and the Foundation. Recommendations are then sent to the Department of State for final consideration and selection. Successful applicants will receive notification of their awards about the end of June, 1957.

Scholarships Under the Fulbright Programme.

The United States Educational Foundation has announced details of awards for Australian lecturers and scholars for the 1957-1958 academic year in the Fulbright and Smith-Mundt/Fulbright competitions.

There are three categories of Fulbright travel grants: (a) Post-graduate students. Persons applying in this competition must intend pursuing a course of post-graduate study at an American institution of higher learning for a full academic year. Doctors taking up intern and resident positions are also eligible to apply. (b) Research scholars and visiting lecturers. Lecturers must have received an invitation to lecture at an approved American institution and must intend spending a minimum of six months in the United States. Research scholars must be undertaking advanced research and the minimum duration of their stay should be three months. Both research scholars and lecturers are required to spend two-thirds of their stay in the United States at their host institutions. (c) Special categories. A small number of grants has been set aside for persons whose professions do not require highly specialized academic qualifications.

Smith-Mundt/Fulbright Awards.—A limited number of dollar scholarships combined with Fulbright travel grants is available for research scholars and visiting lecturers. Applicants are expected to possess a degree at the doctorate level or to have many years of post-graduate research experience.

Applications.—All applicants must be Australian citizens and hold a university degree or recognized professional qualifications. Applicants for Fulbright travel grants must be negotiating for dollar support and university affiliation in the United States. The closing dates are as follows: Fulbright awards for post-graduate students, visiting lecturers and research scholars, February 28, 1957; Fulbright special categories, April 30, 1957; Smith-Mundt/Fulbright, December 31, 1956. Further information and application forms may be obtained from the United States Information Service, Box 89, G.P.O., Canberra, A.C.T.

College of General Practitioners.

QUEENSLAND FACULTY.

In Brisbane on Thursday, September 13, 1956, the Royal College of Gynaecologists and Obstetricians and the College of General Practitioners (Queensland Faculty) participated in a joint meeting during the visit to Queensland of Professor Andrew Clave, the Sims Black Travelling Professor in Obstetrics and Gynaecology for 1956.

The joint meeting heard an address on "Postmaternity", a subject selected by the College of General Practitioners as being of particular interest to its members. After the address, Professor Clave answered questions on a variety of obstetric and gynaecological subjects.

The meeting, the first of its kind in Queensland, was held in the auditorium of the new clinical school of the Mater Misericordiae Hospital, kindly made available by the Sisters of Mercy. Subsequently supper at the hospital provided an informal opportunity for members of both Colleges to meet and discuss problems of mutual interest.

The Queensland Faculty of the College of General Practitioners have expressed their appreciation to the State Committee of the Royal College of Obstetricians and Gynaecologists for the opportunity to participate in this joint activity and sincerely hope that it will be the forerunner of many more with this and other senior colleges.

Naval, Military and Air Force.

APPOINTMENTS.

The undermentioned appointments, changes *et cetera* have been promulgated in the *Commonwealth of Australia Gazette*, Number 57, of October 4, 1956.

NAVAL FORCES OF THE COMMONWEALTH.

Permanent Naval Forces of the Commonwealth (Sea-Going Forces).

Appointment.—Richard George Hingston is appointed Surgeon Lieutenant (for Short Service) (on probation), dated 24th August, 1956.

Emergency List.

Appointment.—Surgeon Commander Hill Gillman Wells, Royal Navy (Retired List), is appointed Surgeon Commander, with seniority in rank of 18th September, 1940, and for temporary service, dated 24th August, 1956.

Royal Australian Naval Reserve.

Appointment.—Surgeon Commander James Stuart Guest, O.B.E., Royal Australian Naval Volunteer Reserve, is appointed Surgeon Commander, with seniority in rank of 31st December, 1955, dated 3rd April, 1956.

AUSTRALIAN MILITARY FORCES.

Australian Regular Army.

Royal Australian Army Medical Corps.

3/40055 Captain G. A. Scott relinquishes the temporary rank of Major, 10th August, 1956.

The Short Service Commission granted to 2/40055 Captain G. A. Scott is extended until 5th November, 1956.

Citizen Military Forces.

Northern Command.

Royal Australian Army Medical Corps (Medical).—1/71801 Lieutenant-Colonel I. M. Mackerras is placed upon the Retired List (Northern Command) with permission to retain his rank and wear the prescribed uniform, 20th September, 1956.

Eastern Command.

Royal Australian Army Medical Corps (Medical).—2/146607 Captain (provisionally) N. G. Arnott relinquishes the provisional rank of Captain, is transferred to the Reserve of Officers (Royal Australian Army Medical Corps (Medical)) (Eastern Command), and is granted the honorary rank of Captain, 17th July, 1956. The following officers are transferred to the Reserve of Officers (Royal Australian Army Medical Corps (Medical)) (Eastern Command): Captains 2/50434 R. J. M. Dunlop, 10th July, 1956, and 2/130103 B. W. Noake, 14th July, 1956. The provisional appointments of the following officers are terminated: Captains 2/127048 D. R. McDonald, 30th September, 1955, 2/127049 G. R. W. McDonald, 29th January, 1956, and 6/15413 W. H. Patterson, 15th April, 1956. To be Captains (provisionally): 2/127048 Donald Raymond McDonald, 1st October, 1955; 2/127049 George Roy William McDonald, 30th January, 1956, and 6/15413 William Hugh Patterson, 16th April, 1956.

Southern Command.

Royal Australian Army Medical Corps (Medical).—The provisional appointment of 3/101027 Captain D. G. Macleish is terminated, 6th April, 1956. To be Captain (provisionally), 7th April, 1956: 3/101027 Donald Gordon Macleish.

Reserve Citizen Military Forces.

Royal Australian Army Medical Corps.

Southern Command.—To be Honorary Captain, 7th August, 1956: Gerald James Little.

ROYAL AUSTRALIAN AIR FORCE.

Permanent Air Force: Medical Branch.

The following are appointed to a temporary commission with the rank of Pilot Officer (Student): James Thomas Cummings (0312881), 3rd March, 1956; Nan Leigh Ferguson (0312882), 21st March, 1956; Peter Barrington Sims (0313287), 14th May, 1956.

Medical Societies.

MEDICAL SCIENCES CLUB OF SOUTH AUSTRALIA.

A MEETING of the Medical Sciences Club of South Australia was held in the Medical School, Frome Road, Adelaide, on September 7, 1956.

Serological Typing of Viridans and Non-Hæmolytic Streptococci.

SIBLEY J. McLEAN reported that antisera had been prepared from viridans streptococci isolated mainly from teeth and gums. The presence of 21 serological types (including *Str. salivarius* and *Str. sanguis* types I, II and I/II) among viridans and non-hæmolytic streptococci from the human mouth had been demonstrated by precipitin reactions with acid extracts. Many of the viridans strains gave "pattern" reactions with groups of antisera. Some of the viridans type strains were closely related antigenically and were also serologically related to streptococci of Lancefield group H, K or O. Of 213 viridans and non-hæmolytic streptococci from normal gums, 162 (76%) reacted with the type sera.

With the exception of *Str. sanguis* II the local viridans types were distinct from those in the classification of Seibert, Simon and Robinson (1949).

One hundred and two strains of viridans and non-hæmolytic streptococci from various animal sources had been investigated serologically. Twenty-eight of those strains belonged to Lancefield group C, D, L or N. There was little serological relationship between viridans and non-hæmolytic streptococci of human and animal origin, and the animal strains appeared to be a much more heterogeneous group than the human strains.

The concluding comment was made that serological typing of *viridans* and non-hemolytic streptococci from various infections might help to throw light on the aetiology of those infections.

Molecular Structure in Biology.

Dr. S. G. TOMLIN, after a reference to the importance of molecular configuration in biological systems, gave a brief account of the methods of structure analysis by means of X-ray crystallography. The way in which those methods had been applied to increasingly complicated organic molecules was outlined, and the present state of work on the structure of crystalline proteins summarized.

Attention was then turned to theoretical ideas on the configuration of polypeptide chains, and the helical and pleated sheet structures of Pauling and Corey were discussed, together with the relevant experimental results afforded by studies of polyglutamate, silk fibroin, polypyrrolone and collagen. Also, as arising from those notions of helical structures, the recent work on nucleic acid (D.N.A.) and on nucleoprotein complexes was reviewed.

It appeared that the past five or six years had seen most notable advances in the attack on the problems of the structures of biological macromolecules.

The scientific programme will be limited to between 150 and 200 speakers and will be divided into eight main specialty sections: general surgery, obstetrics and gynaecology, orthopaedics, neurosurgery, urology, radiology, otolaryngology and ophthalmology. Speakers in radiology, pathology and anaesthesiology will be integrated into each section. Papers and discussions will be held each day throughout the week.

Many of the leading American surgeons have accepted invitations to participate in the programme, and in the list for general surgery alone are the following names among many others: Brian B. Blades, Alfred Blalock, Robert E. Gross, Robert R. Linton, I. S. Ravdin, Claude E. Welch, John H. Gibbon, F. D. Moore, C. P. Bailey, Arthur Allen.

Further information may be obtained from Dr. F. F. Rundle, of the Unit of Clinical Investigation, Royal North Shore Hospital of Sydney, or direct from Dr. F. J. Pinkerton, Director-General of the Pan-Pacific Surgical Association, Room 230, Young Building, Honolulu, Hawaii.

Notice.

THE DERMATOLOGICAL ASSOCIATION OF AUSTRALIA (BRITISH MEDICAL ASSOCIATION).

Trade Exhibit.

A TRADE EXHIBIT will be held in the Wilfred Nickson Wing of the Royal Newcastle Hospital from November 14 to 16, 1956. A large number of drug houses and other exhibitors will display a wide variety of products. The exhibit has been organized by the Dermatological Association of Aus-

Congresses.

SEVENTH CONGRESS OF PAN-PACIFIC SURGICAL ASSOCIATION.

THE seventh Congress of the Pan-Pacific Surgical Association will be held in Honolulu, Hawaii, from November 14 to 22, 1957. All members of the profession are cordially invited to attend.

DISEASES NOTIFIED IN EACH STATE AND TERRITORY OF AUSTRALIA FOR THE WEEK ENDED OCTOBER 6, 1956.*

Disease.	New South Wales.	Victoria.	Queensland.	South Australia.	Western Australia.	Tasmania.	Northern Territory.	Australian Capital Territory.	Australia. ¹
Acute Rheumatism ..	1	3(1)	2	1(1)	1(1)	..	..	..	7
Anchovy ..	..	..	..	..	..	..	..	..	1
Ancylostomiasis ..	..	..	..	..	..	..	..	..	..
Anthrax ..	..	..	..	..	..	..	..	..	..
Bilharziasis ..	..	..	..	..	..	..	..	..	..
Brucellosis ..	..	..	..	..	..	..	..	..	..
Cholera ..	..	..	..	..	..	..	..	..	..
Chorea (St. Vitus) ..	1(1)	..	..	..	..	..	..	..	1
Dengue ..	..	..	..	..	..	..	..	..	..
Diarrhoea (Infantile) ..	9(7)	23(16)	2(1)	..	..	..	..	..	34
Diphtheria ..	1	5(5)	..	..	12(12)	..	..	..	18
Dysentery (Bacillary) ..	..	1(1)	..	..	..	..	..	..	1
Encephalitis ..	..	2(2)	..	..	..	..	..	..	2
Filariasis ..	..	..	..	..	..	..	..	..	..
Homologous Serum Jaundice ..	..	..	..	..	..	..	..	..	..
Hydatid ..	..	..	..	..	..	..	..	..	..
Infective Hepatitis ..	70(25)	86(20)	..	5(5)	3(3)	3	..	..	117
Lead Poisoning ..	..	..	..	..	..	..	..	..	..
Leprosy ..	..	..	..	..	..	..	..	..	..
Leptospirosis ..	..	1	18	..	..	..	..	..	14
Malaria ..	..	..	..	..	..	..	..	..	..
Meningococcal Infection ..	2(1)	5(3)	1	..	..	..	..	..	8
Ophthalmia ..	..	..	..	..	..	..	..	..	..
Ornithosis ..	..	..	..	..	..	..	..	..	..
Paratyphoid ..	1	..	..	..	..	..	..	..	1
Plague ..	..	..	..	..	..	..	..	..	..
Polio-myelitis ..	1	2(1)	3(3)	2	..	1	..	..	9
Puerperal Fever ..	1	2(1)	..	..	..	..	..	..	3
Rubella ..	..	56(25)	..	5(4)	3(3)	..	..	..	44
Salmonella Infection ..	..	..	..	..	..	..	..	..	..
Scarlet Fever ..	5(3)	7(3)	3(1)	2(1)	..	..	..	..	17
Smallpox ..	..	..	..	..	..	..	..	..	..
Tetanus ..	..	..	..	..	3(1)	..	..	..	3
Trachoma ..	..	..	..	..	..	..	..	..	..
Trichinosis ..	..	..	..	..	..	..	..	..	..
Tuberculosis ..	15(10)	15(14)	7(3)	13(10)	14(10)	7(2)	..	..	76
Typhoid Fever ..	..	..	..	..	..	..	..	..	..
Typhus (Flea-, Mite- and Tick-borne) ..	..	..	2	..	..	..	..	..	2
Typhus (Louse-borne) ..	..	..	..	..	..	..	..	..	..
Yellow Fever ..	..	..	..	..	..	..	..	..	..

* Figures in parentheses are those for the metropolitan area.

* Figures not available.

* Figures incomplete owing to absence of returns from Northern Territory.

tralia (British Medical Association), and is to be held in conjunction with its annual general meeting.

An invitation is extended to all doctors in the Newcastle area to attend the exhibition, which will be open at the following times: Wednesday, November 14: 10 a.m. to 5.30 p.m., 7 p.m. to 8.30 p.m. Thursday, November 15: 10 a.m. to 5.30 p.m., 7 p.m. to 8.30 p.m. Friday, November 16: 10 a.m. to 3.30 p.m.

It is emphasized that the display will include products used in all branches of medicine.

AUSTRALASIAN ASSOCIATION OF PSYCHIATRISTS (NEW SOUTH WALES BRANCH).

Freud Memorial Meeting.

THE Secretary of the New South Wales Branch of the Australasian Association of Psychiatrists has advised that a Freud Memorial Meeting will be held in the Robert H. Todd Assembly Hall, British Medical Association House, 135 Macquarie Street, Sydney, on Monday, November 26, 1956, at 8 p.m. Dr. Maida Hall will speak on "Some of Freud's Contributions to Modern Psychiatry". Professor J. A. Barnes, Professor of Anthropology in the University of Sydney, will speak on "Anthropology After Freud". All members of the medical profession are cordially invited to be present.

LONDON MEDICAL EXHIBITION.

THE 1956 London Medical Exhibition is to take place from November 12 to 16 at the Horticultural Hall, Westminster, London. The latest developments in ethical medical products will be shown as well as a wide range of professional apparatus for the physician and surgeon. Modern hospital equipment will also be on view. A full programme of films of professional interest is arranged for each day of the exhibition. The exhibitors at the exhibition include practically every manufacturer of medical proprietaries of note in Great Britain. Professional men and buyers from overseas are welcome, and invitations may be obtained by writing to The Organizers, The London Medical Exhibition, 194-200 Bishopsgate, London, E.C.2.

BRITISH MEDICAL ASSOCIATION (NEW SOUTH WALES BRANCH).

By arrangement with the Director-General, Department of Social Services, Dr. Howard Rusk, Director of the Institute of Physical Medicine and Rehabilitation, Bellevue Medical Centre, New York University, New York, who is visiting Australia at the invitation of the Commonwealth Government, will deliver an address on rehabilitation to the New South Wales Branch of the British Medical Association in the Robert H. Todd Assembly Hall, British Medical Association House, 135 Macquarie Street, Sydney, at 8.30 p.m. on Friday, November 2, 1956.

Nominations and Elections.

THE undermentioned has applied for election as a member of the New South Wales Branch of the British Medical Association:

Cunningham, Patrick, M.B., B.S., 1953 (Univ. Sydney),
14 Myers Street, Sans Souci, New South Wales.

The undermentioned have been elected as members of the New South Wales Branch of the British Medical Association: Drew, John Harvey, M.B., B.S., 1956 (Univ. Sydney); Edwards, Peter Drummond, M.B., B.S., 1956 (Univ. Sydney); Richards, William Russell, M.B., B.S., 1956 (Univ. Sydney); Emery, Douglas Glanville, M.B., B.S., 1955 (Univ. Sydney); Llewellyn-Smith, Ronald Leslie, M.B., B.S., 1955 (Univ. Sydney); Waddell, John James, M.B., B.S., 1955 (Univ. Queensland); Campion, Frederick John, M.B., B.S., 1951 (Univ. Sydney); Dobell-Brown, Noel Glenn, M.B., B.S., 1942 (Univ. Sydney); Gregory, Geoffrey Collin, M.B., B.S., 1950

(Univ. Melbourne); Hyams, Neville Barnett, M.B., B.S., 1953 (Univ. Sydney); Nolan, Thomas Patrick, M.B., B.S., 1952 (Univ. Sydney); Darvas, Frank Alexander, registered in accordance with the provisions of Section 17 (1) (c) of the *Medical Practitioners Act, 1938-1955*; Nevasky, Zygmunt Stanley, registered in accordance with the provisions of Section 17 (1) (c) of the *Medical Practitioners Act, 1938-1955*.

Deaths.

THE following deaths have been announced:

HUGHES.—Thomas Dixon Hughes, on October 12, 1956, at Sydney.

WOOTEN.—Frederick Ismay Wooten, on October 12, 1956, at Sydney.

BLADEN.—Bryant Oswald Bladen, on October 14, 1956, at Perth.

Diary for the Month.

OCT. 27.—New South Wales Branch: Country Branch Meeting at Wollongong.

OCT. 30.—Western Australian Branch, B.M.A.: General Meeting.

NOV. 2.—Queensland Branch, B.M.A.: General Meeting.

NOV. 6.—New South Wales Branch, B.M.A.: Organization and Science Committee.

NOV. 7.—Western Australian Branch, B.M.A.: Branch Council.

NOV. 9.—Tasmanian Branch, B.M.A.: Branch Council.

NOV. 9.—Queensland Branch, B.M.A.: Council Meeting.

Medical Appointments: Important Notice.

MEDICAL PRACTITIONERS are requested not to apply for any appointment mentioned below without having first communicated with the Honorary Secretary of the Branch concerned, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

New South Wales Branch (Medical Secretary, 135 Macquarie Street, Sydney): All contract practice appointments in New South Wales.

Queensland Branch (Honorary Secretary, B.M.A. House, 225 Wickham Terrace, Brisbane, B17): Bundaberg Medical Institute. Members accepting LODGE appointments and those desiring to accept appointments to any COUNTRY HOSPITAL, or position outside Australia are advised, in their own interests, to submit a copy of their Agreement to the Council before signing.

South Australian Branch (Honorary Secretary, 80 Brougham Place, North Adelaide): All contract practice appointments in South Australia.

Editorial Notices.

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ALL communications should be addressed to the Editor, THE MEDICAL JOURNAL OF AUSTRALIA, The Printing House, Seamer Street, Glebe, New South Wales. (Telephones: MW 2651-2-3.)

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